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Effects of Early Decisions on Later Judgments in an Evolving Situation

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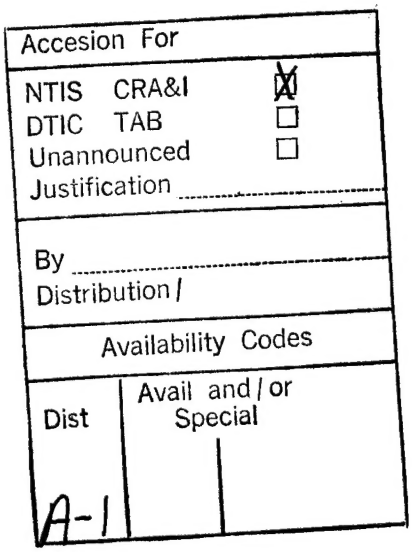

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Army intelligence analysts were given a realistic battlefield scenario and asked to make preliminary decisions about most likely enemy avenue of approach, and their confidence level. Subsequently, they were asked to reconsider their decisions in the light of updated intelligence reports containing some items which confirmed and some which contradicted their early decisions. Three such updating judgments were requested. Finally, they were asked to rate each information item in terms of the degree to which it supported or contradicted their hypothesis.

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EFFECTS OF EARLY DECISIONS ON LATER JUDGMENTS IN AN EVOLVING SITUATION

CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

1.1 Objective

During the last decade significant advances have been made in theoretical formulations of human decision behavior. Fruitful research on inference, choice, and risk assessment has provided us with models and theories about so-called "typical" behavior, including biases or departures from normative models; some of the findings have also shed light on the nature of individual differences in processing information during decision making, often referred to as differences in decision "style."

The bulk of this research has been conducted in an experimental context which can be described as "static." That is, a scenario is presented to the subjects (for example, base rates and witness reports about an uncertain event, or pairs of bets with different expected values), and subjects are asked for their estimates of event probability or their choice of betting options. In contrast, most real decision situations evolve gradually over time, under conditions in which unanticipated events may occur, options may change, previous *decisions may have unexpected consequences, and even goals may change. In many situations an approaching decision deadline induces a task-related stress that, in turn, may affect cognitive behavior.

The objective of this overall research project is to extend our theoretical understanding of decision making to the situation in which a future decision is contingent upon new or continually changing information. The types of information to be considered include new sensor information, unanticipated events, newly available options, reduced option sets, changes in available resources, results of intermediate decisions as they become known, and an approaching decision deadline. In the research reported here, interest focuses on the effect of an early decision on the handling of new information, some of which supports and some of which contradicts that decision. Of particular interest is the extent to which confidence in the early decision is maintained in the face of new information, and the extent to which confirmatory evidence is sought and attended to. Finally, interest centers on the extent to which the results of academic research using artificial problems are found to hold when trained personnel (in this case, Army military intelligence analysts) are performing realistic (but simulated) decision tasks (estimating an enemy's most likely course of action). Results should have implications for both decision training and the design of decision or job aiding techniques to minimize the chances of judgmental error and increase the effectiveness of planning.

1.2 Background

A common rationale for including humans in command and control systems is that they are more "flexible" than machines. This is presumed to mean that humans can quickly perceive new patterns or trends in a situation as it develops, and generate new hypotheses and new options that are responsive to the new conditions. On the other hand, much of the research by behavioral decision theorists suggests that humans, in fact, are not as flexible as they are given credit for. For example, Gettys and Fisher (1979) and Gettys et al. (1981) have shown that people are poor at generating hypotheses and options for action; Wason (1960), Einhorn (1980), and others have shown that people tend to stubbornly hold to a hypothesis generated early, ignore disconfirming

evidence and, in fact, seek confirming evidence. Kahneman and Tversky (1972) have shown that base rate information is often ignored in favor of event-specific data, but that under certain conditions the reverse is true. Fischhoff (1975) and others have demonstrated that people are generally overconfident in the accuracy of their previous decisions, suggesting that they do not easily learn from experience. People tend to misjudge the likelihoods of very rare and very frequent events (Lichtenstein et al., 1978), and are slow to respond to changing event frequencies, being strongly influenced by prior expectations (Howell and Kerkar, 1981). Lopes (1981), in research on sequential inferences, showed that subjects often produce data that are more like averages than Bayesian inferences; she attributed this to a tendency to integrate information serially via an "anchoring and adjustment" process in which new information is integrated into old judgments by adjusting the old value toward the new information, thus producing a final value that lies somewhere between the two. Two significant implications of this work are: first, that cumulative judgments depend importantly on the sequence in which the data are presented (in fact, this has been supported in research by Wallsten, 1976); second, that new data are combined, not necessarily with old *data*, but with *judgments* based on the old data.

Perhaps the best known research on choice behavior under risky conditions is that of Tversky and Kahneman (1981) who have shown that decisions are significantly influenced by the way the problem is framed. Formally equivalent option problems will be responded to differently depending on whether the outcomes are presented as gains (e.g., lives saved) or losses (e.g., lives lost). People tend to be risk-averse for gains and risk-seeking for losses, so that problem framing can have an important impact on risk behavior.

Finally, as indicated earlier, some of the research has dealt with individual differences in decision-making style. Differences among humans cannot strictly be termed "biases" or "limitations;" they are more legitimately regarded as states of nature that must be recognized.

Two extreme styles of decision making have been identified by Hammond et al. (1984)--intuitive (or holistic) and analytic--with most people falling somewhere between the two extremes. Hammond et al.'s research has shown that the actual style adopted by an individual is influenced, not only by his inherent tendencies, but by the nature of the task and by the way problem information is presented (i.e., in tabular or graphical form). In fact, compatibility between type of task and type of display has been shown to be important to the quality of the decision.

Most of the research in which these and similar findings have emerged has been conducted in a relatively static experimental context, in which a single scenario is presented and a single decision is called for. Subsequent trials present essentially the same scenario but with different numerical inputs and each decision is independent of previous decisions. An exception, of course, is the experimental paradigm employed in research on anchoring and adjustment, in which two and sometimes three judgments are called for sequentially, and the scenario is designed to induce judgments that are interdependent rather than independent. Even in these cases, however, the scenarios are stable and only one input value changes from trial to trial; the human information-processing activity occurs at most three times in each decision trial.

On the other hand, many (perhaps most) decision situations evolve gradually

over time. In some cases, as in military planning, the time for action is some time in the future, but the cognitive factors affecting the decision may keep changing. In other cases, such as tactical resource allocation, the decisions are continuous in nature, or at least must be made at frequent intervals but under varying conditions. In both cases, not only may assessed probabilities and utilities change with time, but new options may become available, unanticipated events may occur, and intermediate decisions may have actual consequences different from those that were anticipated. In general, it has been noted that the conditions surrounding a decision, when it occurs, may look quite different than they looked during planning.

It might be thought that military planners are trained to anticipate changing conditions and to be more sensitive to evidence of change, and therefore less likely to perseverate, than the general population. However, in view of the consistency of laboratory findings regarding heuristics and biases in judgment, it is important to determine if similar results are found with trained personnel under more realistic evolutionary decision conditions. The results will add to our theoretical understanding of human decision making, and strengthen the foundation for development of training strategies, decisions aids, and human roles in and interfaces with "automated" planning systems.

With regard to potential concepts for decision aids that might facilitate evolutionary decision making, several examples may be cited. One early effort in this direction was TACAID, a "triangle" display of likely enemy intent and recommended tactical response during an evolving tactical situation (Brown et al., 1975). In this case, the decision maker could change the values in the Bayesian inference model and the multiattribute utility model, and even test out responses other than the recommended one. However, the models were relatively rigid in structure, quantum changes in perceived enemy intent (which might be based on new evidence) could not be easily introduced, and the display was limited to the portrayal of no more than three possible enemy intents.

A more recent example is a "range pooling" aid, which is designed to accept continually changing estimates of target range from several sources and provide a means for arriving at and updating a "best estimate" reconciliation (Cohen and Brown, 1980). Here again, the user could also interact with the model by changing both weights and values, and could also introduce a significant step change into the model with a single input representing a judgment collapsed from any number of information sources. But again, the model was relatively rigid in structure and could accommodate only a limited number of changes (although probably sufficient for the decision being dealt with).

At the other extreme, there have been several attempts to develop generic model structures, usually in the form of decision trees and multiattribute utility models, that gave a user complete flexibility in labeling event nodes and options and in introducing assessed probabilities and utilities. These have been more useful as aids to decision analysts than to users, probably because of the repetitious and tedious nature of the inputs required, and the lack of imagination in eliciting and facilitating dynamically changing inputs over time. What is needed is a serious effort to understand evolutionary decision making and to determine the limits within which such decisions can be made more effective. The report on *Research Needs for Human Factors*, by the National Research Council Committee on Human Factors (1980), pointed out the difficulties inherent in contingent decision planning and recommended research

in this area.

Recent work by Cohen, Thompson and Chinnis (1985) has shown that it is possible to design a decision aid that is both personalized, in the sense that it accommodates a variety of user-preferred representations and information-processing strategies, and prescriptive, in the sense that it encourages and, in some cases, prompts user actions that overcome deficiencies in user-preferred strategies. In effect, such an aid incorporates an expert body of knowledge about procedures that result in typical human cognitive deficiencies, a set of diagnostic routines that identifies inconsistencies in judgment and deficient procedures employed by the user, and prescriptive suggestions and advisory prompts that guide the user (without forcing him) toward more appropriate strategies. The personalized features permit users to deal with the problem at various levels of detail, organize or review data in any sequence or level of aggregation, call for displays in a variety of formats, enter their own judgments in their preferred manner, and perform a variety of sensitivity analyses to assess outcomes. The prescriptive aids are designed to prevent or compensate for deviations from optimality that may emerge from personalization, and to do so in the most nonobtrusive way possible.

Finally, it should be noted that Bayesian models, procedures, and computational aids have been studied for many years as ways to improve the process of revising hypotheses based on new information. Early laboratory research (Slovic and Lichtenstein, 1971) showed that people generally shift their judgments in the direction called for by a Bayesian model, but not sufficiently (this has been called "conservatism"). Attempts have been made to provide computational aids that operate on human inputs of probability or likelihood ratio judgments; these have been criticized by potential operational users because of difficulty in making the required judgments, and because of reluctance to relegate a final decision to a computer (Beach, 1975). In an early application to Army intelligence analysis (Adelman et al., 1982), a Bayesian aid was developed that allowed the user to adjust both the human assessments and the computed results; an evaluation showed that aided intelligence analysts performed more in accordance with the Bayesian model than unaided analysts. The interactive feature helped the user feel that he was in control and that the aid was more of an advisor, but difficult numerical judgments were still required. A more recent investigation by Hall, of the Army Research Institute (in press), tested a computerized aid that provided a multi-attribute utility (MAU) procedure for the initial judgment of most likely enemy course of action, and a Bayesian procedure for revising this estimate as new information is received. The aid, called ENCOA-BAUDI (Enemy Courses of Action-Bayesian Aid for Updating Dynamic Information), was a combination of two aids that had originally been designed as separate packages. A comparison of aided with unaided analysts, working with a realistic tactical scenario, showed that both portions of the aid affected the judgments. The aided group initially regarded all possible courses of action as equally likely, based on the MAU procedure, but were able to select one alternative (the one predicted by the Bayesian model) as clearly more likely after the Bayesian-aided updates. The unaided group, on the other hand, tended to favor two alternatives initially, and persevered with this decision despite additional information. In this experiment, after each of the 18 subsequent items of information was presented, subjects in both groups were asked to give a likelihood ratio (answering the question: How much more likely is the reported activity if the enemy were pursuing avenue X versus avenue Y), and also predicted the probability of the avenues. Bayesian calculations based on the likelihood ratio

judgments gave the same results for both groups, showing that their judgments about the information items were the same, but the final probability judgment of the unaided group was quite different from the calculated result.

These findings demonstrate that unaided intelligence analysts show the same tendency as has been shown by subjects in more artificial settings, namely, adherence to early decisions despite new information that even they may judge to be contradictory. The results also show that a Bayesian aid can reduce this tendency. However, subjects felt that the required likelihood ratio estimates were difficult to make, and that updating the probability estimates after each incoming report would be too time-consuming under operational conditions. Conclusions of this study were that an aid would be useful but that the interface should be less numerical and not require explicit likelihood ratio estimates. It was also recommended that, since analysts do not typically work alone, subsequent research of this type should use teams of two or more analysts as subjects.

In related research by Irizarry and Knapp (1985), an attempt was made to explore the problem-solving and judgmental strategies used by military intelligence personnel. In this study, paper-and-pencil problems were presented in booklet form to a group of experienced subjects. The problem tasks dealt with four aspects of problem solving relevant to intelligence analysis:

1. Hypothesis testing (seeking of confirmatory or disconfirmatory evidence);

2. Pattern identification (recognizing covariation among events);

3. Integrating new and old probabilistic information;

4. Problem structuring strategies used to handle large data sets.

Two versions of each task were used, and the wording was in terms of an operational MI ("applied") task whenever possible.

There were several findings relevant to the present study. In hypothesis testing, MI experts were consistent with academic research findings, showing a significant tendency to seek confirmatory evidence, but less so in the applied version of the task, suggesting that knowledge of task content produces more sophisticated hypothesis-testing behavior. In integrating new with old probability information, they were unlike most people; they tended to modify new information on the basis of prior base rate data, although not by application of a Bayesian model. The subjects were much more proficient than the general population in using all relevant information to identify patterns or relationships among events. In handling large data sets, five different strategies were identified. A "matrix" approach (organizing data into rows and columns of relevant dimensions) was most effective, although infrequently used. These findings have important implications for training and in some cases job design, and should be verified using more realistic simulated exercises.

The research reported here is an attempt to further the investigation of cognitive behavior underlying intelligence analysis by experienced personnel, employing realistic tactical scenarios in which the situation evolves. Par-

ticular interest is focused on the effects of early decisions on the interpretation and utilization of subsequent information and on subsequent decisions.

2.0 PROCEDURE

2.1 General Description

Army military intelligence specialists were given a scenario and background information relating to a developing battlefield combat situation in Central Europe, in which an enemy attack was expected against the U.S. 52nd Division. Working in teams of two, they were asked to play the role of staff intelligence analysts, review the materials, including maps and overlays, and provide the G-2 with their estimate of the most likely avenue of approach (north or south) for the enemy's main attack, their degree of confidence on a scale of 0 to 100%, and the basis for their decision. Following their initial decision, they were given updated intelligence reports from several sources. There were 15 items in each updated report, designed so that 3 items tended to support a northern approach, 3 supported a southern approach, and 9 were neutral (in the opinion of a former Army officer who generated them). Subjects were asked to review the new information and provide a new estimate, confidence level, and basis for decision. Three such updates were provided, and estimates were obtained after each. Following the third update, they were asked to review the items in each update report, and give each item a rating on a 5-point scale: +2 for strongly supportive of their decision, +1 for weakly supportive, 0 for neutral, -1 for weakly contradictory to their decision, and -2 for strongly contradictory. Discussions between the two subjects in each team were tape-recorded (with their consent), and analysis time was measured.

The initial scenario material was almost the same for each team. The only differences were in the disposition of an enemy second-echelon tank division and some divisional artillery units, for which there were three conditions: Scenario A, enemy forces slightly positioned toward favoring a northern attack; Scenario B, enemy forces slightly positioned toward a southern attack; and Scenario C, enemy forces centrally located. See Figures 2-1, 2-2, and 2-3. Four subject teams were assigned to each of the three groups*. The updated intelligence reports were exactly the same for all teams.

2.2 Scenario and Materials

The scenario was a modified version of a Fulda Gap scenario obtained from Fort Leavenworth, where it is used during training at the Command and General Staff College. All the relevant information (except the update reports) was available to the subjects in two notebooks and two wall-mounted maps with overlays. The notebook material was as follows:

*Because of scheduling problems, only three teams were available for Group C, and in one of these cases the second member of the team was not available; therefore one subject worked the exercise alone.

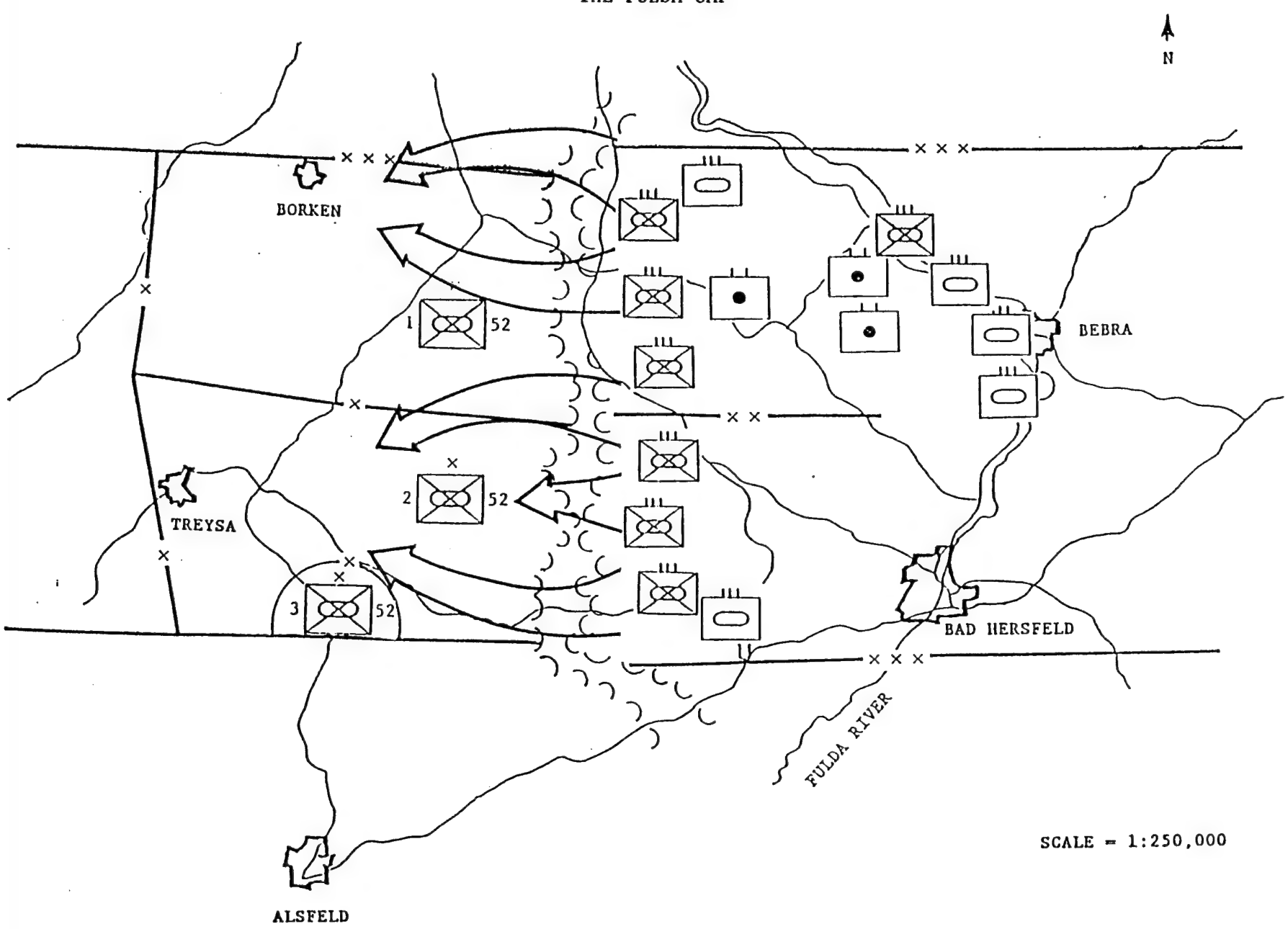

Figure 2-1: Scenario A

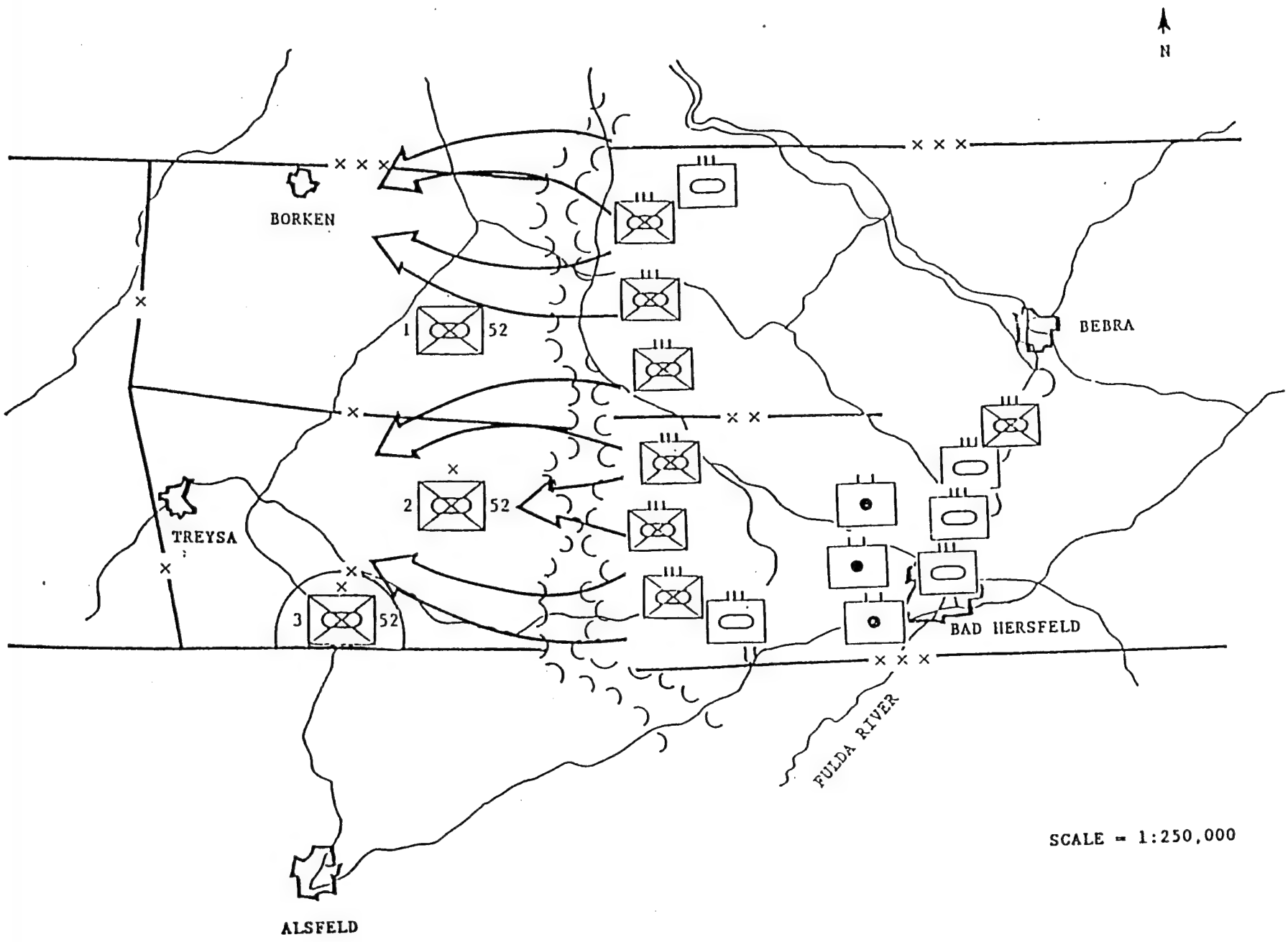

Figure 2-2: Scenario B

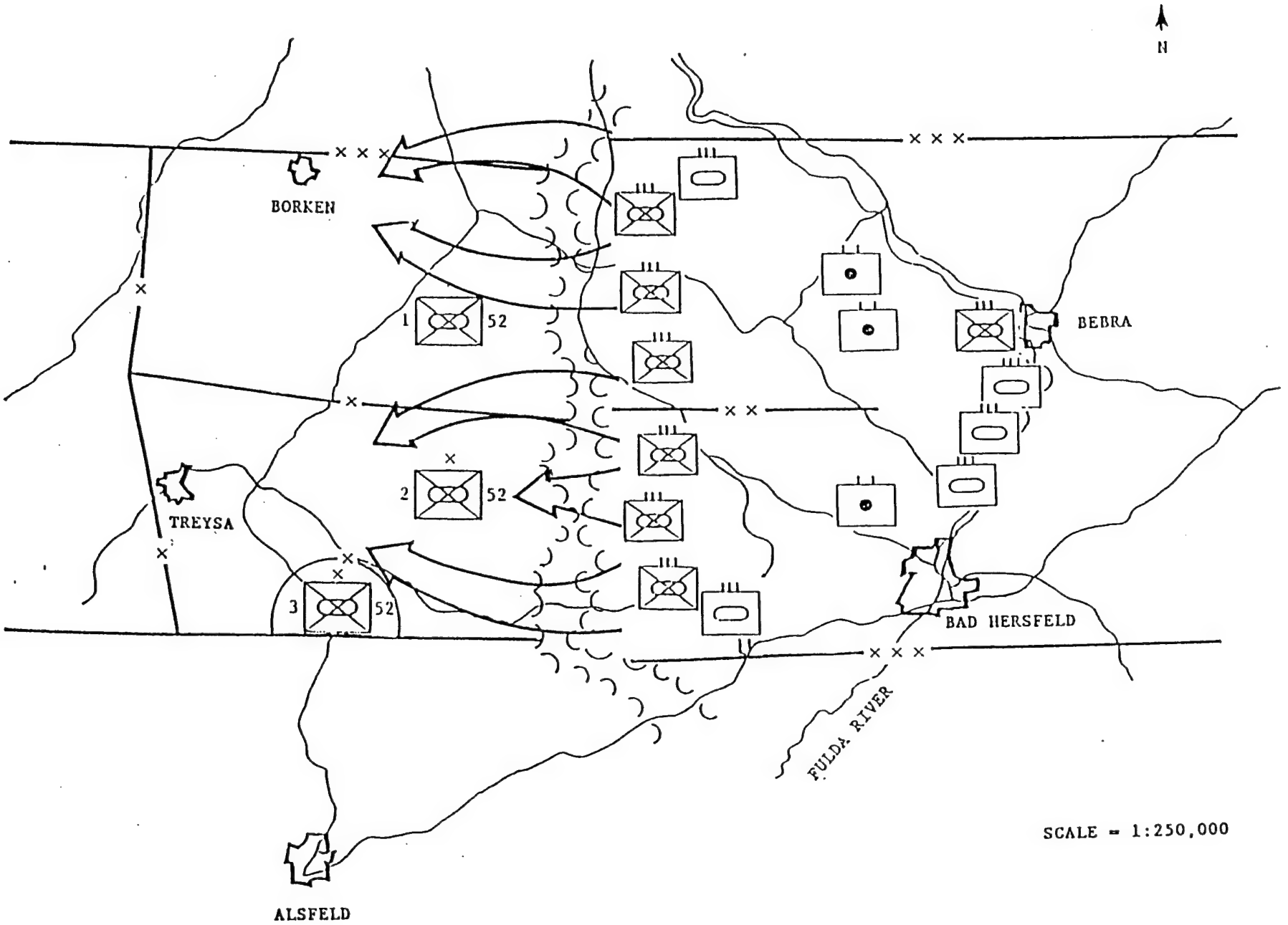

Figure 2-3: Scenario C

Intelligence Notebook:

G-3 Briefing (mission, 3-day history, current situation)
Division Commander's Guidance
Summary of Enemy Activity
Weather and Terrain Conditions
Capabilities and Vulnerabilities

(Enemy) Order of Battle Notebook:

Composition
Disposition (three versions, as described in Section 2.1)
Strength
Tactics
Miscellaneous

The material contained in each notebook is presented in Appendix A.

The large-area wall map covered an area of 28,800 sq. kilometers. Two overlays were used with it; one showed own Corps and enemy forces as of three days ago, the other showed the current situation. The small-area wall map covered the immediate battle situation, an area of 3,600 sq. kilometers. One overlay presented the (already completed) terrain analysis; a second overlay showed own Division deployment; a third showed enemy force deployment (three versions as described in Section 2.1). Subjects were encouraged to plot on a fourth, blank overlay, and were provided with marker pens for that purpose.

The G-3 briefing and the Division Commander's Guidance were read to the subjects by one of the experimenters, a former Army officer, using the wall maps as references, in order to speed up the indoctrination period.

2.3 Instructions to the Subjects

Each session was opened with introductions, a description of the general purpose of the research (to study decision making in an evolving situation and to identify opportunities for job aids and training techniques), assurances that this was an experiment rather than a test, that no individuals would be identified by name, and that results would be statistically aggregated. Subjects were then asked to describe their training, experience and MOS. They were told that four hours had been set aside for the exercise, and were asked if they had any objections to their discussion being recorded (none did).

They were then read the following instructions:

1. You are an intelligence analyst assigned to the G-2 section of the 52nd Mechanized Infantry Division. It is now 0600 hours on 19 August.

2. The G-2 is attending a meeting with the Chief of Staff to establish the staff planning schedule. He has left orders for you to be briefed by the G-3 Plans Officer on the corps situation over the last three days and on the division commander's planning guidance. He has asked you to become familiar with the Order of Battle Workbook, the Intelligence

Workbook, and the intelligence SITMAP.

3. The G-2 has already determined that the enemy is preparing to continue the attack. Working with another analyst, you are to review the situation, analyze enemy courses of action, and reach a conclusion as to the most likely location of the enemy main attack. You will brief your results to the G-2 when you are completed.

4. All available information for your analysis is contained in the workbooks and the SITMAP overlays.

5. After you have reached your conclusion and briefed your results, you will be given a set of updated intelligence reports and asked to review your conclusion and revise it if desired. There will be three such updates during the course of the session.

They were then read the G-3 briefing at the large-area wall map, and the Division Commander's Guidance at the small-area map, and the description of their assigned task was repeated. They were then asked to review the situation and make their first estimate whenever they were ready. The intelligence update reports are presented in Appendix B.

After each estimate, subjects were asked for their confidence level and the basis for their judgment. After the final estimate, they were asked to rate each item in the update reports, as described in Section 2.1. There followed a general discussion of their previous experience with this type of exercise, and of any comments or suggestions they might have for job aids or training techniques.

2.4 Subjects

Subjects consisted of 18 officers (Captains) and 3 enlisted personnel (First Sergeants) with military intelligence specialties, taking advanced courses at the U.S. Army Intelligence Center and School (USAICS), Fort Huachuca, Arizona. The officers had MOS designations of 35-G (signal intelligence), 35-E (counter intelligence) or 35-C (image interpretation), and were about 4 weeks into a 10-week course qualifying them as 35-Ds (tactical intelligence), during which they had been given at least one exercise of the type used in this research; however, most of their previous experience (operational or field exercise) had been in their MOS specialties. The enlisted personnel all had MOS designations of 96-B, and were just completing a 12-week Advanced NCO Course (ANCOC); two of them had had overseas experience in the Far East, the other had very little experience doing intelligence work.

Most of the subjects had 4-6 years of active-duty military experience, although one of the enlisted personnel had a total of 19 years in service. However, they had little, if any, operational experience doing tactical intelligence analysis. Nevertheless, most of them were reasonably familiar with the type of battlefield scenario and background materials presented to them, and had learned enough about the prescribed analytical procedures, enemy order of battle, doctrine, etc., to understand their task and provide a plausible rationale for their decisions.

3.0 RESULTS

3.1 Initial Decisions and Confidence Levels

It will be recalled that the initial information given to the subjects was the same except for the disposition of an enemy second-echelon tank division and some divisional artillery units, which were varied slightly in an effort to induce different initial decisions. Group A was given a version that slightly favored a northern enemy avenue of approach, Group B a southern approach, and Group C, ambiguous. However, the actual decisions did not quite match these expectations. The distribution of initial estimates across groups is given in Table 3-1.

Table 3-1: Distribution of Initial Decisions, by Group

Decision	Group A	Group B	Group C	Total
North	2	-	-	2
Center	-	1	-	1
South	2	2	3	7
Far South	-	1	-	1

The responses obtained included north, center, south, and far south (an approach to the south of the divisional area). Two of the Group A teams produced the only two north responses, but most of the responses were south. Subjects' discussions suggested that the southern avenue of approach was somewhat favored by terrain factors (good roads favored a high-speed tank approach), and to some extent by the fact that the enemy had suffered recent losses in the north, with some adverse effect on morale.

The more interesting finding relates to the degree of confidence expressed in the initial decisions. Table 3-2 shows the initial confidence level expressed by each team, by group and by initial decision. The table shows that, regardless of the decision made, the expressed confidence levels are surprisingly high; all except one team expressed a confidence of 70% or higher, four teams were as high as 85 or 90, and the average confidence level was 77.3%. Even when teams within the same group made different initial decisions (as happened in Groups A and B), comparably high confidence levels were given. There is no objective basis for assessing whether or not these results are evidence of over-confidence on the part of the subjects, but, based on the amount of information given to them, and the large amount of enemy forces whose locations were not provided, the confidence levels appear notably high.

Table 3-2: Initial Confidence Levels

Group	Initial Decision	Confidence (%)
A	North	75
A	North	80
A	South	90
A	South	55-60
B	Center	70-75
B	Far South	85
B	South	70
B	South	75
C	South	85
C	South	70
C	South	90
	Average	77.3

The extent of analysis conducted by the subjects varied considerably. Some of them examined the workbooks in some detail, while others tended to focus on the SITMAP plots, and referred to the workbooks only to try to associate enemy units with parent organizations. All teams attempted to define the composition of enemy units to some extent, but the time taken and the extent of analysis varied considerably. Also, although all teams examined the terrain (maps and terrain analysis overlay) to some extent, only a few of the teams referred to miscellaneous background information in the OB workbook such as training, logistics and personalities.

One indication of the extent of analysis conducted is the amount of time taken from the end of the initial instructions and briefing to the subjects until they said they were ready to give their initial estimate. This analysis time varied considerably, from 14 minutes at one extreme to 52 minutes at the other, with a median of 30 minutes. This is significantly less than the time usually taken for a complete intelligence analysis, but it should be recalled that the terrain analysis (which may take about two hours) had already been performed, and the OB and Intelligence Workbooks were made available with current data and did not need to be updated.

It was thought that there might be a relationship between analysis time and level of confidence. Specifically, if the initial scenario information led to a rapid and confident impression of the likely enemy avenue of approach, there might be a tendency to cut short the analysis and rely on this early "intuition." The opposite causal relationship might also hold, namely, that a tendency toward an intuitive rather than analytical approach might result in a team overlooking some important indicators and rushing to a conclusion with a high level of confidence. In either case, one would expect a negative correlation coefficient between analysis time and confidence level. A Pearson r between the two sets of data was -.46, not statistically significant for the relatively few number of cases (11). This result is suggestive at best, and should be verified with a larger sample.

3.2 Effects of Subsequent Information

It will be recalled that all teams were given the same updating information, in three sets of 15 items each. After each set of updates, they were asked to review the situation, give an updated estimate of most likely enemy avenue of approach, their reasons, and their confidence level.

The main finding was that, regardless of their initial decision, all except one team remained with their original estimate, and their confidence levels tended to increase. One team which had initially given a southern approach as most likely, held to this decision until the final update, when it shifted its estimate to a northern approach with a confidence of 50-55%. (For purposes of statistical analysis, this was converted to a 45-50--or 47.5%--confidence in a southern approach.)

Table 3-3 shows the trend in confidence levels with successive updates; the data are averaged for teams grouped according to their initial decisions. Except for the teams whose initial estimate was north, the average confidence level rises for all teams, and even for the north group, confidence remains at 70% or above. In fact, when individual team data are examined, they show that in 7 of the 11 cases (63.6%), the final confidence level was higher than the initial level, and these 7 cases represented all four of the initial decisions. Thus, the same set of update information led to increased confidence regardless of the initial decision.

Table 3-3: Trends in Average Confidence Levels

Initial Decision	(N)	Initial Confidence	1st Update	2nd Update	3rd Update	Number of Teams for which Confidence Rose
North	(2)	77.5	72.5	75	70	1
Center	(1)	72.5	80	80	85	1
South	(7)	76.8	80	82.8	80.4	4
Far South	(1)	85	90	95	92.5	1
						7 (63.6%)

As noted above, each team gave its confidence level after each update report. With 11 teams and three updates per team, there were 33 instances where a team might change its confidence level. Of these 33 instances, 16 showed increased confidence, 10 decreased confidence, and 7 remained unchanged. Applying a sign test, a ratio of 16:10 is not statistically significant. However, it will be recalled that each update report contained three items suggestive of a northern approach, three suggestive of a southern approach, and nine neutral. Thus, each update report was designed to provide some support for two mutually exclusive hypotheses, and to balance out as neutral. Thus, one might expect to find an increase in the confidence of the team judging "center", as indeed was found, but a *decrease* in confidence of the other teams. The fact that there was no decreasing trend is suggestive of a confirmation bias.

3.3 Effects of Initial Decision on Reactions to Subsequent Information

It will be recalled that after the third and final update, subjects were asked

to review all the items in the three update reports, and rate each item with regard to the extent to which it supported or contradicted their estimate, or was neutral. A rating of +2 indicated strong support; +1, weak support; 0, neutral; -1, weak contradiction; and -2, strong contradiction. There were 15 items in each update report. If the ratings for each update report were arithmetically totaled, the possible extreme scores would be +30 and -30. The expected score would be 0, since in each report 9 items were designed to be neutral, 3 to suggest a northern approach, and 3 a southern approach.

The first question to be addressed in how the teams perceived the items in the most general sense--that is, did they regard the update reports as generally supportive of their initial decision. If so, it would suggest that they were, in fact, attending more to supportive than to contradictory information.

Table 3-4 shows the average arithmetical total score given to each update report by teams grouped according to their initial decision. Although the scores for the first two update reports by the north group were low, there is a clear tendency to interpret the update reports as supportive of the initial decision, whatever that decision was. This tendency can be seen also in Figure 3-1, which shows the distribution of all ratings for each group separately, and for the total. The number of 0 (neutral) ratings predominates, approximating 60% for all except one group. However, the frequency of positive ratings, ranging from 8.9% to 33.3%, clearly surpasses the frequency of negative ratings, which ranges from 0 to 14.4%. In fact, for the group as a whole, if the neutral ratings are ignored, the highest frequency (16.6%) is for the +2 (strongly supportive) rating.

Table 3-4: Average Arithmetical Total Score for each Update Report

Initial Decision	Average Score		
	1st Update	2nd Update	3rd Update
North	+ 1	+ 1	+ 6
Center	+11	+12	+19
South	+ 5.6	+ 4.6	+ 3
Far South	+10	+ 8	+ 7

The teams' discussions indicate that they generally base their decisions on three or four items of information, often including information in the original scenario if it has not changed. As would be expected, those items in the update reports which are cited as reasons for decisions are given positive ratings. This suggests that subjects pay more attention to supportive than to contradictory evidence. But the tendency to rate items as positive rather than negative suggests that incoming information is generally *perceived* as supportive of previous decisions, regardless of the decision.

In order to explore this hypothesis more fully, the ratings assigned to individual items in the update reports were examined. It will be recalled that there were three update reports, each containing 15 items, making a total of 45 items. The subject teams produced four different decisions or estimates regarding most likely enemy avenue of approach: north, center, south, and far south. One question of interest is the number of items that were perceived as support (i.e., received a positive rating) for more than one estimate.

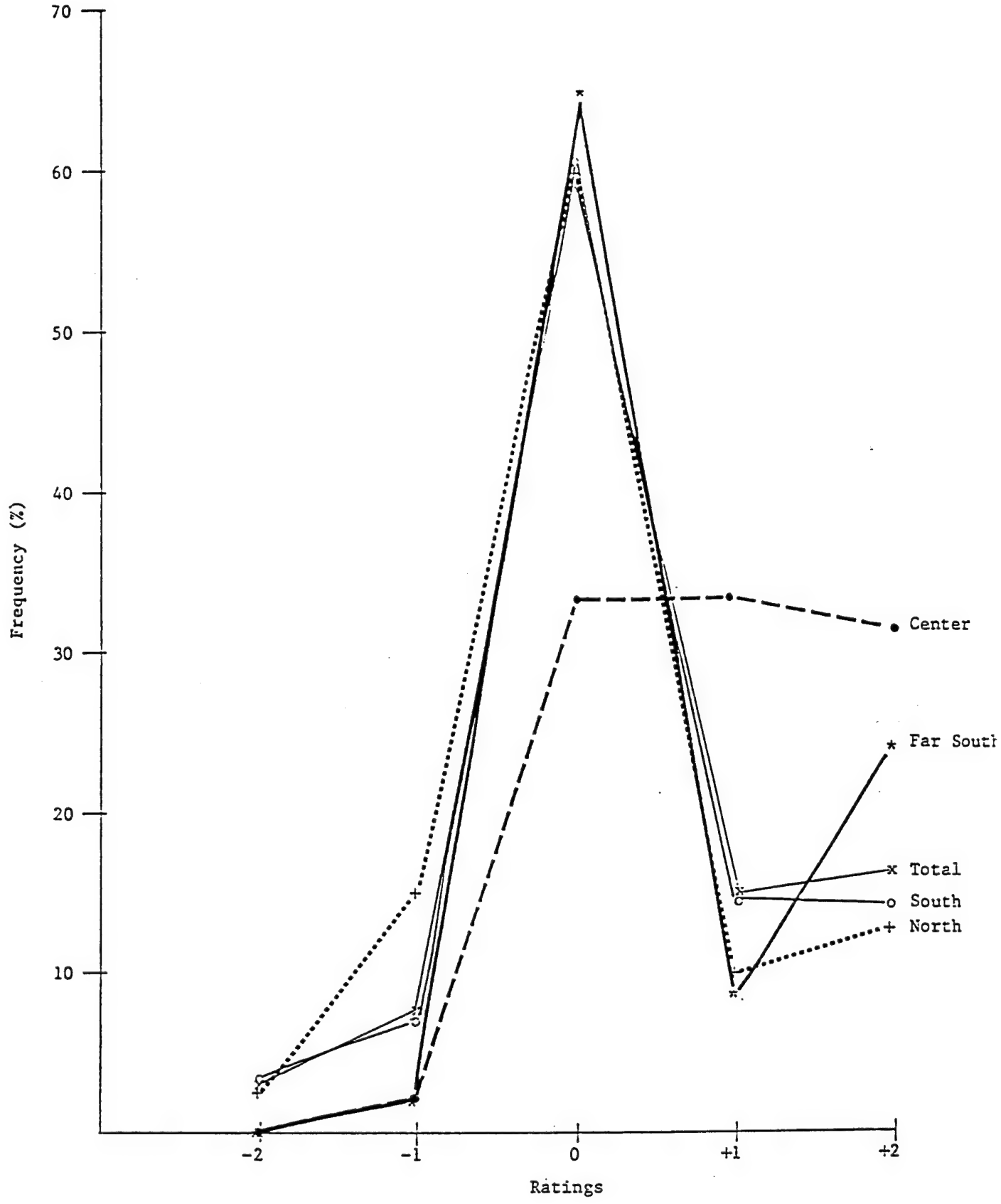

Figure 3-1: Distribution of Ratings

Of the 45 items in the update reports, 26--or 57.8%--received a +1 or +2 rating for more than one estimate. According to inference theory, this in itself is not a surprising result, since a given item of evidence can often support more than one hypothesis, and this should be recognized by persons involved in the inference process. However, in this experiment, the ratings were given by different teams who had started with different estimates, rather than by a single team recognizing the nature of inferential evidence. Of course, the rating task as presented to the subjects did not permit them to rate an item as positively supporting more than one estimate. However, one would expect that, if an item were perceived as support for more than one estimate, it would be given a 0 (neutral) rating. And, in fact, the discussions supported the idea that such a perception did indeed underlie the assignment of neutral ratings. Therefore, we conclude that a previous decision can, in fact, influence the perception of updating information in favor of that decision.

In the aggregate, the ratings suggest an overall trend toward a confirmation bias, that is, a tendency to perceive items as supportive of an early hypothesis, regardless of what that hypothesis is. A more detailed analysis of the individual item ratings was performed to identify any pattern to this bias. Specifically, we tested the data statistically for two possible patterns--a "directional" bias in which contradictory items were perceived as supportive, and a "magnitude" bias in which contradictory items were recognized as contradictory but were weighted lower than supportive items. For these analyses, we discarded the data for the team whose initial estimate was "Center," since this hypothesis might not be mutually exclusive of either "North" or "South." (Note that this is a conservative approach, since that team's ratings were much more strongly positive than any of the others'.) The data were then split into two sets reflecting mutually exclusive hypotheses, the N (North) set (n=2), and the S (South) set (n=8), which for this analysis included "Far South." Finally, items for which either the N set or the S set were all 0s were discarded, since that would suggest a unanimous perception of non-diagnosticity by those teams.

To test for directional bias, we looked for the following two patterns in the remaining items:

1) update items where none of the ratings in either the N or S set were negative. These could be viewed as directionally biased, since they were perceived consistently as positive support for two mutually exclusive hypotheses;

2) update items where *all* the ratings (other than 0) in one set were in the opposite direction from those in the other set. These could be viewed as directionally unbiased, since they were perceived as discriminating between the two hypotheses.

Of the 45 items, there was only one item that satisfied the first pattern, and 10 that satisfied the second ($p<.006$, sign test). If the criteria are loosened to include items with one violation of a perfect pattern, then the number of directionally biased and unbiased items was 2 and 12 respectively ($p<.02$, sign test).

This result means that, with the "Center" hypothesis discarded, and the "Far South" included with the "South" hypothesis, there was more agreement than disagreement on the perceived *direction* of support for individual items. That is, analysts tended to agree on which hypothesis was supported by items that they viewed as diagnostic.

If a magnitude bias were shown, analysts would tend to perceive supportive items as strong evidence for their hypothesis, and disconfirming items as weak evidence against. To test for this bias, we calculated the average support score on each item for the N set and the S set. An item was labeled as reflecting a magnitude bias if both averages were positive (this would also reflect a directional bias) or if a positive average in one set was larger than the negative average in the other. It was labeled as not reflecting a magnitude bias if both averages were negative or if a negative average in one set was larger than the positive average in the other. If an item received an average score of 0 in both sets, it was discarded, on the grounds that it was perceived as irrelevant.

Of the 45 items, 26 reflected a magnitude bias, 3 did not, and 15 were discarded as irrelevant. Using the sign test, the probability of a ratio of 26:3 is less than .0001.

It should be noted that for 16 items, there was at least one positive rating in both the N and S sets. These might be regarded as showing a slight directional bias (perceived as supporting two mutually exclusive hypotheses), although against a looser criterion than was applied in the directional bias test described above. In a second analysis, these items were discarded; of the 10 items showing a perfect directionally unbiased pattern, 9 showed a magnitude bias and 1 did not ($p<.011$, sign test).

These analyses, using very conservative criteria, show a consistent confirmation bias. However, the bias is principally one of degree rather than direction. That is, when an item of information is regarded as diagnostic, analysts tend to interpret correctly the hypothesis which it supports (although there are many exceptions). However, there is a strong and significant tendency to underrate the importance of items that disconfirm an early hypothesis, relative to confirming items.

3.4 Discussion of Information Used

Subjects' degree of familiarity with the various aspects of the Soviet equipment, organization and tactics was critical to their decisions. For example, subjects were generally not familiar with Soviet air defense weapons and employment and, therefore, discounted the presence, in the rear, of an air defense unit that is normally employed with frontline forces. On the other hand, the subjects were very familiar with Soviet ECM equipment, and seemed to place a lot of importance on a communications jammer discovered on the enemy north flank. This behavior is consistent with the "availability" heuristic observed by Tversky and Kahneman (1982).

During their analysis, subjects generally did not give any consideration to enemy units that were not shown on the SITMAP. For example, the scenario initially identified 17 out of 33 artillery and rocket battalions, and the three updates identified only four more battalions. Thus, by the end of the exer-

cise there was still a sizable force of 12 battalions of artillery which was not located. The subjects preferred to compare the known number of battalions in the north and the south to determine where the attack was "weighted." The assumption was that the known units were a representative random sample of the total.

The responses seemed to demonstrate a general insensitivity to the sample size itself. Army-level assets were considered the most diagnostic because the Soviet doctrine states that these assets will be weighted on the main attack. The initial situation showed 3 battalions on one avenue of approach (north or south) and 0 on the other avenue. If the subjects assumed that two-thirds of Army-level battalions would be found on the main attack and one-third on the supporting attack, then the initial situation would put the odds at 8 to 1 that the attack would come where these units were located.

The first update located an additional battalion in the south. After the 1st update, the odds would increase to 16 to 1 if the initial units were in the south and decrease to 4 to 1 if the initial units were in the north. The second update located another battalion in the north and the third update located additional units in the north and south. After the second and third updates, the odds returned to 8 to 1, while the sample size grew to 7 units (5 on one avenue and 2 on the other avenue).

Yet, subjects invariably cited the weight of Army-level artillery as a significant factor in their initial estimate, while they never mentioned it as a significant factor following the third update. This might indicate, as Kahneman and Tversky found, that subjects focus on the sample proportions rather than the sample size. Thus, subjects seemed to believe that proportions of 3:0 are more diagnostic than proportions of 5:2 regardless of sample size.

Time and space dimensions were often ignored or misused in the estimates. For example, the 7th TA had "settled in for the day" 60 kilometers from the front and presumably would not begin moving again for another 12 hours, with another 6 hours or so before it could deploy into battle. Yet, subjects sometimes considered its deployment imminent, while other subjects ignored it as if it were part of another war. No subjects created a timeline to fit the attacks of the first-echelon divisions, the second-echelon division, and the second-echelon army into a logical pattern.

Base rates and base rate changes were generally neglected by the subjects. For example, GSP ferries are found at both the division and army levels in Soviet organizations. Subjects usually associated the piece of equipment with one level or the other and based their estimate on this stereotype. An examination of the base rates, however, shows that the odds of the ferries being an Army asset are nearly 5 to 1. In another example, a company of T-64 tanks was located in the north. While most subjects simply discounted the small size of the unit, some subjects attempted to determine whether the tanks were part of the first-echelon division or second-echelon division. Since almost all of the tanks in the first-echelon division were of this type (97%), the subjects generally assumed that the tanks belonged to the first echelon, despite the fact that the second-echelon division had more total T-64 tanks.

Experience of the subjects seemed to be a factor in their style. The very experienced and the least experienced seemed to favor an intuitive style. The

subjects who knew some procedures and facts tended toward an analytic solution, as if by looking up the answers in the workbooks they could find the correct answer. The experienced/inexperienced subjects seemed less distracted by the small facts and data bits.

The subjects seemed very much influenced by visual aids and cues. The number of unit "counters" displayed on the map seemed to draw their attention more than the size or strength of the units represented by the counters. The subjects spent much more time looking at the map than they did reading the workbooks. While some map skills were deficient and some grid coordinates were misplotted, most subjects were very comfortable working on the map.

Some subjects were quite willing to explain contradictory information as deception in many cases. This interpretation caused them to score a "-" as a "+" if the data fit the deception concept. Many subjects commented during the post-exercise discussions that training in the recognition and interpretation of enemy deception operations was an area for improvement.

In many cases, the more experienced subjects would predict future enemy activity that would tend to support their initial estimate, and to give a strong weight to these indicators if they occurred. For example, if a southern attack was hypothesized, the enemy might be expected to move tanks in that direction, impose radio silence, or initiate artillery action in that sector. These activities would be regarded as strong indicators of a southern attack if they occurred, even though there was some likelihood of their occurrence under other circumstances as well (in fact, they might be regarded by another team as strong indicators of a different enemy course of action). In a few cases, the team members discussed the implications of the anticipated event *not* having occurred ("negative" indications). The experimental setting did not provide for an explicit rating of expected but non-occurring events, but the verbal protocols suggested that negative indications had some effect on confidence levels, at least for the more experienced teams. Typically, they would look for the events in subsequent update reports, and if the events did not occur by the third update, the expressed confidence level would be lowered. Table 3-3 (it will be recalled) shows that the general tendency is for confidence in the initial decision to be higher at the end of the evolving situation than at the beginning. However, examination of the table also shows a tendency for confidence to drop slightly after the third update. It was of interest to determine if this tendency was more pronounced among the more experienced subjects; if so, it would support the interpretation that they were more responsive to negative information in that it lowered their confidence in their hypothesis.

In order to determine degree of experience, the years of active-duty experience of the more experienced member of each team was used as the measure. This was done because it was invariably at the instigation of the more experienced team member that expected indicators were identified, if at all. Table 3-4 shows the average years experience for three groups--those who showed lower confidence after the third update, those who showed no change, and those who showed a higher level.

Table 3-5: Experience as Related to Final Shift in Confidence

Direction of Shift	Average Years Experience
Down	11.4
No Change	7
Up	4.6

The results show a distinct relationship between the direction of confidence shift and amount of experience. The more experienced teams tended to lower their confidence after the third update. This trend is consistent with the interpretation given above. The identification of future indicators could be an important aid in filtering and processing information, provided their use is consistent with inference theory. We will have more to say about this in Section 4.0.

Finally, during the discussion at the end of the session, several interesting comments and suggestions were made by the subjects. A central problem in the field appears to be the large volume of intelligence data received by the analyst, data that is often incomplete, late, or unreliable, and compartmentalized by type of source or by area so that only a partial picture is available to any single analyst. The importance of filtering was stressed repeatedly, although the basis for any prioritization scheme invariably relies on judgments of relevance which, in turn, implies a broad rather than partial view. One team thought that information consistent with an initial hypothesis should be filtered out, and only contradictory information examined; this scheme would of course be vulnerable to the type of bias shown in this experiment, that of perceiving new information as supportive, regardless of the hypothesis.

The MICROFIX system was mentioned by several subjects. This is essentially a computerized Order of Battle database which can be accessed in several ways to help determine the capabilities of units and associate them with parent organizations. Considering the amount of time required to look up this kind of information in tables, and the possibility for error in associating units with parents, MICROFIX would seem to be a useful decision support system. However, those familiar with it did not consider it more than an index file, and stated that it did not relieve them of the necessity to maintain manual records. (We were unable to schedule a demonstration of MICROFIX, and therefore cannot comment based on first-hand knowledge.)

A general explanation of many of the results observed in this experiment might be that the overall approach to intelligence analysis exhibited by the subjects is that of attempting to generate a consistent interpretation and explanation (model) of the data available. That is, rather than treating each update item as an independent source of evidence, lending support to one hypothesis or another, the tendency was to generate a model based on information available early, and then seek to account for the update items in terms of this model. This, in turn, requires that update items superficially inconsistent with the early hypothesis be "explained away" (e.g., "It's a deception").

This general problem-solving strategy may be typical in many real-world problems where all the evidence items are generated by a single "ground truth." Under such a circumstance it might be reasonable to believe that if one could generate a hypothesis that explains available data consistently, then that explanation is likely to reflect the ground truth. That is, it is unlikely that one could generate an explanation that is both consistent and wrong.

Given the above described process and general belief about real-world problems, one might anticipate the following behaviors:

1) if a consistent explanation is found, then confidence in that explanation will be high;

2) as more data become available, then confidence should increase as long as the data can be explained in terms of the present hypothesis (even if it is explained away);

3) as long as an individual evidence item can be accounted for by the present hypothesis, then that item should be considered as positive support for the present hypothesis, since it increases the number of data items that are consistently explained.

The degree to which all three of these tendencies are observed should reflect, in this framework, an analyst's base rate belief that a consistent explanation is also likely to be a correct explanation. Experienced analysts, having been fooled once or twice in their careers, presumably have a lower base rate for this belief than the inexperienced analyst. This, in turn, should make them less confident in their present belief, and more willing to "look around" for other possible explanations.

This explanation is consistent with some of the results being found in a related DSC study on Elicitation of Expert Knowledge, also being sponsored by ARI. In that study a variety of techniques are being tested for eliciting the knowledge of intelligence experts with regard to situation development and order of battle. Some of the experts in that study were presented with an initial situation (also a European conflict scenario) depicted on a map, followed by a sequence of intelligence reports. The experts typically generated the most likely initial hypothesis, and as new information was provided they updated the map and their assessment of the situation. Although no confidence judgments were elicited, the experts clearly discussed each new item in terms of its consistency with their existing situation assessment. Information that was potentially conflicting with the current assessment was often "set aside", that is, it was plotted on the map without interpretation. When sufficient amounts of such information accumulated, the expert would then develop a sub-hypothesis to explain the data in terms of his current situation assessment. It should be noted that the analysts' task in that study was not to discriminate among alternative hypotheses, but rather to develop the hypothesis. However the results support the finding that early decisions affect the interpretation of information received later in that there is a tendency to seek consistency with models developed initially.

4.0 CONCLUSIONS

4.1 Discussion of Findings

The results of this experiment lend support to the general conclusion that trained subjects in an evolving, realistic, decision environment demonstrate similar performance characteristics as do novices working with less realistic and relatively more static scenarios. Specifically, confidence in an initial hypothesis is generally high, regardless of the hypothesis. Confidence tends to increase (although not significantly) as new information is received, even though that information is on balance neutral or ambiguous and therefore might be expected to cause reduced confidence. Confirmatory evidence is sought, and new information in the aggregate is regarded as supportive, regardless of the initial hypothesis. The confirmatory bias tends to be one of magnitude rather than direction; that is, when hypotheses are mutually exclusive, diagnostic evidence is typically interpreted accurately as supporting one or the other hypothesis, but evidence supportive of an early hypothesis is given significantly more weight than non-supportive evidence. Disconfirming evidence is sometimes viewed as confirming. More experienced analysts often predict and watch for events that would confirm their hypotheses; the occurrence of these events has a strong positive effect, while their non-occurrence leads to waiting and to some lowering of confidence after the final update (this is not true of less experienced personnel). Analysts appear to generate a "model" of the situation based on early information, and to account for new information in terms of consistency with this model.

Familiar ("available") classes of information play a disproportionately large role in decisions. Base rates are often ignored when enemy units are being associated with their parent organizations. When the locations of large numbers of enemy units are unknown, inferences about enemy unit locations are based on small samples. Information presented on a graphic display is attended to more than that in tabular form, often leading to highly intuitive rather than analytical approaches.

The finding that unaided intelligence analysts adhere to early decisions despite new evidence that may be contradictory, supports similar findings by Hall (in press), who also used experienced Army subjects performing a realistic simulated tactical battlefield problem. The tendency for confidence to increase as the situation evolves, regardless of the initial decision, lends even more weight to the importance of developing techniques to reduce this tendency. The overweighting of supportive information as compared with disconfirming evidence not only reveals a focus on confirmatory evidence, as was found by Irizarry and Knapp (1985), but may suggest a misunderstanding of the nature of inferential reasoning. The fact that more experienced analysts use an event prediction procedure that helps to attenuate these tendencies by increasing awareness of negative indicators, supports the finding by Irizarry and Knapp that knowledge of task content results in more sophisticated hypothesis testing strategies. Their finding that base rate information is used by intelligence analysts more than by the general public suggests that analysts understand its significance and can utilize it reasonably well if it is readily available to them,as it was in their study but not in ours. It will be recalled that base rate was provided as part of the problem description in their study, while in ours it had to be sought for and retrieved from the OB Workbook, as it must under operational conditions. The general tendency for all our subjects to rely heavily on graphic displays is consistent

with the findings by Hammond et al. (1985) that there is a relation between the type of task and the preferred decision style and display format.

These findings have implications for potential improvement of intelligence analysis performance, through two lines of approach: one is through improved design and utilization of graphic displays; the other is through improved techniques for training and aiding the inference process. These two lines of approach are discussed below.

4.1.1 Design and utilization of graphic displays. The experimental results demonstrated that the subjects were most comfortable working with the map displays as compared to the workbooks. Some subjects were relatively intuitive in their approach, spending a lot of time looking "holistically" at the mapboard. Others were more analytical in that they referred to the workbooks for detailed data, but even they would plot the data and analyze it at the mapboard.

It is tempting to speculate about the potential value of a computer-generated system that might display all the information now contained in the workbooks as well as each item of new information as it arrives. Such a system would permit rapid examination of selected classes of information, correlation of reports from several sources, generation of dynamic scenarios that would be expected, given any of several hypotheses about enemy intent, rapid wargaming to help develop own plans, etc. However, such a recommendation would go well beyond the findings of this study. Instead, we will describe two types of display that might help strengthen the weakest areas of performance identified herein. They could easily be incorporated in a sophisticated system as described above, but might also be accommodated to some extent in a less sophisticated, manual version.

4.1.1.1 *Order of battle display.* The first display is the enemy order of battle, including known strength and disposition of forces. A primary objective of such a display would be to facilitate the process of associating enemy units with parent organizations. This process is time-consuming when done by referring to the OB Workbook, and as found in this study, is conducive to possible error due to ignoring of base rate information. MICROFIX is one approach to improving this process, since it permits access to the OB database by unit (as well as by parent organization), but it does not display the results graphically. The doctrinal template used during intelligence preparation of the battlefield (IPB) is a related concept, since it shows in graphic form the enemy doctrinal deployment of forces for various types of operations; doctrinal templates display information such as composition, formations, frontages, depths, equipment numbers and ratios, and high-value targets. However, they are based on standard doctrine and do not reflect current information about the specific enemy forces in the area of interest (actual strength and disposition to the extent known). A unique feature of the recommended display is that enemy forces whose location is not known would also be displayed in an area adjoining the map display. Thus, not only would known information like base rates be readily available at the mapboard, but it would enhance the analyst's awareness of the amount of information that is still unknown. We predict that it would reduce the tendency to arrive at early decisions with high confidence on the basis of a small sample of data.

4.1.1.2 *Graphic event prediction.* The second display builds on concepts currently embodied in event templates and events analysis matrices, which are

used in the IPB procedure. Event templating is the identification and analysis of significant battlefield events and enemy activities which provide indicators of the enemy course of action; it is a projection of what will most likely occur if the enemy adopts a particular course of action, and may be viewed as a depiction of scenarios or plans likely to be generated by the enemy. Such scenarios are often effectively produced by a "devil's advocate," in this case by an analyst who assumes the role of an enemy planner. Event templates are graphic depictions of named areas of interest (NAIs) such as bridges, road junctions, choke points, etc. where enemy activity is likely to occur, for various enemy avenues of approach and mobility corridors within them. Event analysis matrices provide, in tabular form, supporting information such as the description of the NAI, distance from previous NAI, estimated time of the event, and type of event or activity.

It will be recalled that the more experienced subjects in the experiment did, in fact, identify future events or indicators, but only those likely to occur if their initial hypothesis about enemy intent was correct. The occurrence of predicted events increased their confidence in their hypothesis, even if the same event could have supported another hypothesis. Non-occurrence of the event was usually ignored, at least until the final update, when it sometimes caused a lowering of the confidence level.

The objectives of the recommended display and the features designed to achieve them, are described below:

1. Accommodate the general preference for working with graphic rather than tabular data. To accomplish this, it is suggested that the NAIs on the event template be coded to show information now shown in the matrix--specifically, type of NAI, type of enemy event or activity, and estimated time.

2. Encourage attention to the non-occurrence of expected events. This could be accomplished by displaying estimated time as a time-window (range of times) or as a probability distribution and by highlighting the NAI if the event does not occur. It is recognized that non-occurrence may mean only that a report of the event has not been received; however, a pattern of non-occurrences along one possible enemy avenue of approach, contrasted with positive indicators along another, might suggest a shifting of probabilities.

3. Encourage awareness that some events can support more than one hypothesis, and facilitate identification and recognition of such events. To a large extent, this will depend on training innovations (see Section 4.1.2), but better use of graphics can help. Specifically, a predicted or observed event, such as radio silence, that could indicate unit movement in one of several directions, should be uniquely coded to highlight that fact. If prior analysis indicates that the event would lend greater support to one hypothesis than another, this differential degree of support might also be coded. But the primary purpose of this feature is to prevent premature adoption of one hypothesis and biased interpretation of ambiguous events as supportive.

4. Encourage adoption of the role of "devil's advocate" in generating

likely enemy plans. If a relatively sophisticated computer-based system is feasible, it should include a capability for a dynamic display of predicted enemy movement and activity for any assumed avenue of approach. This display should incorporate accurate time-distance relationships for the types of units and terrain involved. Ultimately, such a system could be developed into a wargaming tool for the tactical commander, but for purposes of this report, the concern is limited to its use as an aid to intelligence analysis.

4.1.2 Training implications. The important implication of the findings for training purposes is that military intelligence students would be benefited by stronger emphasis on the interpretation of evidence in the inference process. Specifically, they should keep all likely hypotheses firmly in mind as new information is received, and be taught to understand that an item of information may in some cases lend support to more than one alternative. It would be useful for them to be exposed to at least some of the literature in the field of behavioral decision research, especially the findings dealing with overconfidence and the tendency to seek confirmatory evidence, since an awareness of these cognitive biases may help reduce the tendencies. Finally, they should be given practice in making situation assessments under the type of evolving scenario conditions employed in this experiment. Many of the subjects expressed the view that more practice in such exercises would be beneficial.

Another recommendation, although tentative, is to formalize a modified version of the rating procedure used in this experiment. It will be recalled that, at the conclusion of the session, subjects were asked to rate each item of information in all three update reports, in terms of its degree of support for or contradiction to their selected enemy avenue of approach. In practice they were able to do this quickly and easily, although with a strong bias toward positive (supportive) ratings. This type of rating task appears to be simpler and more natural than that of assigning numerical probabilities, as would be required in a Bayesian procedure.

Two modifications are proposed that might convert this rating procedure into a training aid. The first is to have the students rate each item of information as it is received rather than at the end of the exercise. The second is to require that separate ratings be made for each hypothesis or alternative under consideration, rather than for only the one considered most likely. This would force the student to keep alternative hypotheses in mind as the situation evolves, rather than focusing on one and seeking confirmatory evidence for it. This procedure would also help the student learn that an item of information may, in fact, support more than one alternative, and possibly result in more neutral ratings. In any event, it should counteract the tendency for the same information to cause an increase in confidence regardless of the initial decision.

4.2 Recommendations

It is recommended that follow-on experiments be conducted to test the effectiveness of the two graphic displays (order of battle and graphic event prediction) and the modified procedure for rating information items. These experiments should be conducted at Fort Huachuca early in the second year of this contract, and if the techniques prove effective in countering the ten-

tiveness of the two graphic displays (order of battle and graphic event prediction) and the modified procedure for rating information items. These experiments should be conducted at Fort Huachuca early in the second year of this contract, and if the techniques prove effective in countering the tendencies found here, further steps should be taken to institutionalize the concepts as job aids or training aids, as appropriate.

Meanwhile, serious consideration should be given to incorporating into the advanced officers and enlisted courses at USAICS some training material on the nature of evidence in the inference process and the kinds of biases typically shown (overconfidence in early decisions and the tendency to seek and attend to confirming evidence). We would be able to provide details on the specific material that would be appropriate, after discussion of the total curriculum and course objectives with school personnel. Finally, students should be given more frequent practice in dealing with evolving scenarios of the type used in this experiment.

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APPENDIX A:

MATERIAL CONTAINED IN INTELLIGENCE AND OB WORKBOOKS

Problem Introduction

(Use Overlay 1, dtd 160600 Aug)

A. Original Corps Disposition

1. US 10th Corps with two divisions (52 MID and 23 AD) and the 201st ACR was to defend from approximately 7km north of Bebra to approximately 8km south of Fulda, a frontage of about 65km.

2. 52 MID was on the north flank, defending a 35km front which extended south to just beyond the Stoppelsberg, while 23 AD had about a 30km front from there south.

3. The MBA was to run generally along the Fulda and Haune Rivers.

4. The 52 MID formed its own covering force to operate between the MBA and the International Boundary while the 201st ACR acted as the covering force in front of the 23 AD.

5. On the north flank of 52 MID was the 28th Panzer Division, assigned to the southern flank of the German 3rd Corps.

B. Original Corps Mission

1. The Corps mission was to defend its assigned sector, preventing significant enemy penetrations into West Germany, to defeat the 10th CAA and the 4th TA, and to provide a base for the CENTAG counterattack.

2. The 52 MID mission was to defend in sector and to destroy the first echelon divisions of the 10 CAA.

3. It was anticipated that the major enemy thrust into the 10 Corps sector would take place around Hunfeld and might consist of as many as 4 divisions of the 4 TA with the 3 divisions of the 10 CAA operating on about a 40km front to the north of Hunfeld. Thus, priority of assets had gone to the 23 AD.

Current Situation

A. History to Current Time (Use Overlay 1)

1. Since this overlay was drawn, the frontage of the 10 CAA turned out to be much narrower than what was originally thought and the disposition of forces within the 10 CAA were different than originally supposed.

2. Early on 17 August the 10th CAA attacked across only about a 26km front, roughly the area defended by 1st and 2nd Bdes of the 52 MID in the north. In a surprise move, they attacked with their tank division leading which quickly rolled up the covering force.

3. In a well-coordinated attack, around 1800 on the 17th, the two MRDs of the 10 CAA then penetrated our main defense line on the north and south flanks of the 9TD, apparently attempting a double envelopment of 1st Bde and parts of 2nd Bde.

4. The double envelopment was halted but similar problems in 23 AD sector made the main defense line untenable and the Corps commander ordered a pull back to phase line Bravo around 0600 on 18 August some 30 hours after the initial attack.

5. For the past 24 hours, 1st and 2nd Bdes have been steadily delaying back to phase line Charlie under heavy pressure by the 71st MRD in the north and the 128th MRD in the south.

6. Meanwhile, the fighting in the 3rd Bde sector had been relatively light. They have been facing elements of the 48th MRD of the 4th TA since the onset. It is apparent now that the 48th MRD has been screening between the two main thrusts of 10 CAA in the north and the other 3 divisions of the 4th TA in the south.

(Go to Overlay 2, dtd 190600 Aug)

7. Due to the critical situation on both flanks, the Corps commander decided yesterday afternoon to relieve the 3 Bde of the 52 MID and elements of the 1st Bde, 23 AD by bringing the 201 ACR on-line in that area. This occurred during the night last night.

B. The Current Situation

1. Last night on 18-19 August, elements of the 71 MRD and the 128 MRD launched 3 separate attacks against 1 and 2 Bde positions, nearly penetrating our defenses in all three instances. They attacked toward Homberg in the north forcing our defenders back to just east of that city; the situation has settled down in that area. They also attacked toward Schwarzenborn, actually penetrating our lines at one time, but have now withdrawn east of the Efze River in that sector. Finally, around 0200 this morning, 19 August, they launched an allout attack up the Aula River valley, nearly resulting in a rout of the troops in that sector; however, a new defensive line has been established west of Oberaula and things have also calmed down in that sector. In fact, except for close range fighting south of the Schwarzenborn Gap, things have settled down all along the 52 MID front, with 71 and 128 MRDs apparently fairly well spent.

2. The 201 ACR has relieved the 3rd Bde which, with its two remaining battalions, has withdrawn into the Schonberg area awaiting further orders.

3. During the intense fighting last night, the 9TD of the 10 CAA crossed the Fulda with almost no interdiction and are now in assembly areas only 10-15kms from our frontlines.

4. Also the 7 TA has been moving up the autobahn by night marches and has apparently settled in for the day with its lead elements around Eisenach, only about 60km from 52 MID frontlines.

5. 28th German Panzer Division is holding well against moderate to heavy pressure in the north by elements of the 8 CAA. On our southern flank, 48 MID of the 4 TA shows no signs of pressing the attack against the 201 ACR. Further south, the 23 AD is on good defensive terrain east of Lauterbach and now appears to be in no immediate danger. Thus, the Corps commander has no immediate plans for a general withdrawal.

VERBATIM COPY OF DIVISION COMMANDER'S GUIDANCE (190600 August)

52 DIV MECH (USE GERMANY 1:50,000 SCHLITZ-ALSFELD with Order of Battle OVERLAY)

The 52nd has been in a very significant fight over the past two days,and I believe that we have given a good account of ourselves. We have taken considerable casualties, but we have probably given better than we have taken. I have just come back from talking with the Corps commander, and we both agree that the current lull in the battle will give us an opportunity to regroup, re-organize, and resupply. Our basic mission remains unchanged; namely, to defend in sector, to destroy the first echelon of the 10th CAA, and to prevent a breakthrough in our sector which would permit the enemy to roll up the flanks of our adjacent units as well as to seize the communications center of TREYSA.

As you know the 201st ACR has relieved two battalions of the 3d Brigade, and this relief allows us to shorten our defensive lines and to establish a reserve sufficient to counterattack any attempted penetration into our area.

Despite the fact that the 201st ACR has taken over on our south flank, I still consider the BAD HERSFELD-ALSFELD corridor a potential enemy avenue of approach. G2, we will watch that situation to ensure that the enemy does not open up our south flank.

I see two other critical avenues of approach into our sector; first, the BAD HERSFELD-NEUKIRCHEN-TREYSA avenue which is the most direct approach in our area for enemy entry into the KASSEL-FRANKFURT corridor. Secondly, enemy pressure on the 28th Panzer Division along the corps north boundary could provide an avenue of approach along our north flank through OBERBEISHEIM-HOMBERG-BORKEN which could provide the enemy direct access to our rear area from the northeast. I am very concerned about this. Such a flanking action could split the NATO forces in two.

I see at least three broad courses of action that might be worth developing;

CA 1- Defend assigned sector with brigades on line weighted to defend against an enemy main attack along the OBERBEISHEIM-HOMBERG-BORKEN (northern) avenue of approach and the reserves located well forward in a position to counterattack an enemy penetration.

CA 2- Defend assigned sector with brigades on line weighted to defend against an enemy main attack along the OBERAULA-NEUKIRCHEN-TREYSA (southern) avenue of approach and the reserves located well forward in a position to counterattack an enemy penetration.

CA 3- Defend assigned sector with two brigades on line balanced to defend against an enemy main attack along either the OBERBEISHEIM-HOMBERG-BORKEN avenue or the OBERAULA-NEUKIRCHEN-TREYSA avenue with the reserve brigade located rearward in a position to block or counterattack an enemy penetration along either avenue of approach.

I don't want you to feel constrained by these, though. G3, you have the freedom to modify them as you see fit. If appropriate, eliminate courses of action as necessary, and don't hesitate to suggest a better one if you can.

G2, I want a sizable intelligence collection effort to address the activities of the 10th CAA but also the activities of the enemy's 7th Tank Army in reserve. Commitment of the units of the 7th TA can cause us some very serious problems. Reports of any activities there will give me an early indication of his intended course of action. Keep a critical eye on all of his second echelon units.

G3, don't overlook the necessity for rear area operations to protect our combat service support installations and operations. If he dumps some air assault elements in behind us, he could really give us fits.

G1, get humping to get us some replacements as quickly as possible. If we want to remain combat effective, and I assure you we do, we cannot continue our casualty rates without significant replacements.

G4, keep your logistical installations dispersed and not too far forward. Coordinate closely with the G3 as you analyze the courses of action and make sure we have the maximum flexibility and protection for the logistical operations.

As you prepare your estimates, keep in mind that the enemy has the capability to use both nuclear and chemical weapons to support his attack; therefore, you should analyze all of our possible courses of action in light of this possibility. Let's not present him so lucrative a target that he cannot resist the use of nuclear and chemical weapons. I will say, however, that as long as he is enjoying some success in his attack by using conventional weapons, I do not expect him to escalate the conflict by using tactical nuclear weapons. G2, I want to know immediately if you have any indication of his possible use of these weapons.

If there are no questions, the Chief of Staff will schedule the presentation of your staff estimates.

SUMMARY OF ENEMY ACTIVITY

Enemy units in contact (six MRRs of 71 GMRD & 128 MRD) have been fighting hard and taking heavy casualties the past 24 hours.

Several indicators point to low supply in the two divisions in contact. Continued presence of 7 TA in 10 CAA rear and recent destruction of main rail line should cause continued resupply problems in 10 CAA for the next 48 hours. 71 GMRD in north has suffered the heaviest casualties and consumed the most ammo and POL. Estimate that the two MRRs in front of HOMBERG should be incapable of further major offensive action. The divisional tank regiment, now confirmed as being in the hills west of WICHTE (NB4154) took heavy casualties during their offensive two days ago and must be at no more than 70% combat strength with little POL or ammo reserve--should be capable of only limited offensive action.

128 MRD in the south is in only slightly better shape. MRR in front of TF 1-3 AR and TF 1-4 AR near SCHWARZENBORN is probably incapable of further offensive operations; elements of this MRR were spotted moving to the rear earlier this morning with no known replacements in the area. Further south the BMP & tank units now around OBERAULA are probably in better shape than any other unit in contact. The location of the tank regiment from 128 MRD is still not known for certain, but it is believed to be part or all of the enemy buildup around KIRCHHEIM that occurred last night. This TR probably is still capable of limited offense.

All or most of 9 GTD crossed the FULDA last night at multiple crossing points. This crossing was virtually unopposed as all available firepower was used to support heavily engaged frontline units. Their movements were tracked into multiple assembly areas either side of the highway between ROTENBURG in the north and BAD HERSFELD in the south. 9 GTD saw only limited action the first day and should have been at least partially resupplied that night. They are probably at 80-85% combat strength and capable of 24 hours of offensive operations without further resupply.

Army moving up in the rear is probably the 7 TA with what appears to be three tank divisions and one MR division. A tank division identified as 6 GTD with T-72 tanks is in the vanguard. 7 TA has been traveling along parallel routes at night, halting during the day for past three days and appears now to be halted with forward elements just west of EISENACH, 60 KM from front. Entire column is about 100 KM long by about 10 KM wide. Attempts to interdict column have been generally unsuccessful due to very effective enemy air defense.

Enemy low altitude air defense within 10-15 KM of the FEBA is losing its effectiveness. Success of friendly CAS early today and SIGINT & Air Force estimates suggest that enemy frontline AD is at 50-60% of its original effectiveness. Continued resupply problems should add to this weakness.

Enemy has not used nuclear weapons anywhere along European Front, and there are no confirmed reports of Soviet use of chemical or biological weapons. Appears NATO threat to treat chemical weapon use as same as nuclear is working. 10 US Corps cautions that setbacks in Soviet offensive increase the likelihood that they will resort to use of NBC Weapons.

Enemy artillery support continued heavy throughout the night last night, diminishing only with the slowdown in offensive activity around daybreak. Soviet superiority of 8:1 in FA & rocket firepower has diminished little despite the estimated destruction of over 100 enemy artillery weapons in our sector in the last 48 hours. It is believed that lack of resupply will hamper enemy artillery support beginning today. The enemy heavy MRL battalion that has barraged our CPs three times since hostilities began has not been located since an air-strike hit it around 0930 yesterday. It is believed to still be combat effective, and continued tight COMSEC/ELSEC is advised along with frequent CP moves.

WEATHER AND TERRAIN CONDITIONS

a. Weather

(1) SITUATION

See weather report and forecast 181800 Aug (next page).

(2) EFFECT ON ENEMY COURSES OF ACTION

Cross-country movement is expected to remain unhampered for next 72 hours.

Increasing cloud cover will lower visibility to 1.5 KM by 211200 Aug with .5 KM visibility and rain expected by 221200 Aug.

Wind direction will gradually shift from north to west over next 96 hours, hampering enemy smoke operations or use of NBC Weapons.

Increasing cloudiness and humidity over next 72 hours should decrease enemy ECM effectiveness and hamper his nap-of-the-earth air operations.

Weather conditions should be favorable for enemy high speed offensive operations for only the next 24-36 hours; within 96 hours expected moderate-to-heavy rains should slow offensive operations significantly.

Weather favors a shift in enemy tactics from rapid offense to at least a brief period of reduced movement by 22 Aug.

(3) EFFECT ON OWN COURSES OF ACTION

Cross-country movement should remain unhampered for next 72 hours.

Visibility will gradually decrease over next 96 hours to .5 KM by 22 Aug decreasing range at which enemy armor can be engaged but decreasing ability of of enemy forward observers to detect our movements. Night visibility should drop to near zero by 21/22 Aug, bringing night operations to a near standstill.

Wind direction will gradually shift from north to west over next 96 hours, favoring our use of smoke or nuclear-chemical weapons if required.

Increasing humidity will lessen enemy ECM effectiveness and low cloud cover should bring low level air operations on both sides to a near standstill by midday 21 Aug.

Our delay operations are slightly favored over enemy offensive operations by wind direction and visibility over next 72 hours, but rain on 22 Aug will hamper both.

A defense in position is counterindicated by weather conditions until 22 Aug when rain should greatly reduce mobility.

Weather favors friendly counterattacks of limited depth on 20 and 21 Aug when lower visibility, favorable winds, and good mobility should prevail.

1. WEATHER HISTORY

DATE	TEMP (F) MIN	MAX	PRECIPITATION TYPE	AMOUNT	SURFACE WIND DIR	VEL	VISIBILITY KM*
14 AUG	49	78		0.0	NW	5	3.5
15 AUG	50	80		0.0	NW	8	3.5
16 AUG	46	78		0.0	NNW	8	3.0
17 AUG	45	75		0.0	WNW	15	3.0
18 AUG	45	75		0.0	NW	10	3.0

* VISIBILITY 0.25 KM IN EARLY MORNING FOG

2. WEATHER FORECAST

DATE	LIGHT BMNT	EENT	TEMP (F) MIN	MAX	PRECIP TYPE	AMT	WIND DIR	VEL	VIS KM	HUM	CLD	BAR	MOON
19 AUG	0403	2059	47	75		0.0	N	12	3.0	60	1/4	30.02	3Q
20 AUG	0404	2057	50	77		0.0	NW	15	2.5	65	5/8	29.87	3Q
21 AUG	0406	2054	50	74		0.0	WNW	12	1.5	85	5/8	29.54	3Q
22 AUG	0408	2052	45	72	RAIN	0.3	W	18	0.5	100	8/8	29.49	4Q
23 AUG	0410	2050	48	75		0.0	SW	5	1.5	80	1/2	29.51	4Q

b. TERRAIN (See Terrain Analysis Overlay)

(1) SITUATION

Observation and fire

On the north flank around HOMBERG terrain is relatively open with fields of fire out to 2 KM in places. East of Autobahn E4 terrain closes with steeper grades and more timber. West of HOMBERG terrain is quite open with observation up to 7 KM between HOMBERG and BORKEN (NB1955).

In the central sector between REMSFELD (NB3350) and GREBENHAGEN (NB3340) there are steep hills and heavy forests. The EFZE River cuts a deep canyon between the two forces, but higher elevations on the east side favor the enemy. West of the EFZE the terrain opens somewhat, but observation and fire are still severely restricted until around FRIELENDORF (NB2247) where the ground levels out and is about 50% forested.

On the south flank from SCHWARZENBORN (NB3140) to HAUSEN (NB3232)there are several larger open areas but the slopes are steep. West of SEIGERTSHAUSEN (NB2540) and NEUKIRCHEN (NB2435) the ground opens up before TREYSA (NB1340) allowing observation out to 10 KM in places.

Cover and concealment

On the north flank around HOMBERG there are several villages, HOMBERG itself, and small forested areas to provide cover and concealment. Hills provide concealment from direct observation but generally are not steep enough to provide cover from direct fire. East of Autobahn E4 both cover and concealment improve. West of HOMBERG the flat open ground provides little cover or concealment except for the forest south of FREUDENTHAL (NB2352).

In the central sector between REMSFELD and GREBENHAGEN cover and concealment are plentiful. It is slightly better on the enemy side of the EFZE but steep hills and about 70% forest cover continue for some 8 KM west of the EFZE River. After that available cover/concealment is reduced by probably 50% until the SCHWALM River, some 20 KM to the rear of the current FEBA.

On south flank from SCHWARZENBORN to HAUSEN the hills are still steep, but there are more open areas with less cover/concealment than in the central sector. These conditions prevail 10 KM either side of the current FEBA but west of NEUKIRCHEN is a broad open plain some 10 X 8 KM in size with villages providing the only concealment.

Obstacles

On the north flank several steep grades channel armor into a 2 KM wide area just east of HOMBERG. West of HOMBERG the EFZE has steep banks channeling armor thru MUHLHAUSEN (NB2655) and CASSDORF (NB2552) with one narrow ford between these two. South of CASSDORF the river is fordable at almost any point. Between the EFZE and BORKEN, few natural obstacles exist and open land continues some 30 KM north.

In the central sector between REMSFELD and GREBENHAGEN steep grades channel armor onto existing roads and a few narrow canyons. Some 2 KM west of the EFZE River the terrain opens somewhat but armor is still channeled into valleys no more than 1 KM wide. West of FRIELENDORF maneuver areas up to 2 KM wide exist. There are no water barriers in this area between the EFZE and the SCHWALM, some 20 KM distance.

On the south flank from SCHWARZENBORN to HAUSEN it is like the central sector--more cleared areas but grades remain steep, channeling armor into narrow valleys. West of NEUKIRCHEN the land is open for some 11 KM to TREYSA.. Villages are about 2 KM apart in this area and the SCHWALM and ANTREFF Rivers provide minor water barriers, otherwise few natural obstacles exist.

Key terrain features

On the north flank the city of HOMBERG is key terrain blocking enemy access to open country to the west. High ground west of REMSFELD (NB3150) controls EFZE River valley corridor. OBERBEISHEIM (NB3554)-NIEDERBEISHEIM (NB3654) villages and WICHTERHOHE Pass (NB3953) control our access to enemy north flank.

In the central area, from REMSFELD to GREBENHAGEN the villages of SCHELLBACH (NB3149),HULSA (NB3244), and HERGETSFELD (NB3243) would be primary enemy penetration points. In our rear, city of FRIELENDORF is a major feature on the north-south LOC.

On the south flank from SCHWARZENBORN to HAUSEN the villages of RICHBERG/ LAGER SCHWARZENBORN (NB2938) and pass at OLBERODE (NB2934) would be primary enemy penetration points. The villages of SEIGERTSHAUSEN and NEUKIRCHEN are key access points into open area in our rear, and the city of TREYSA is the key feature on the LOC in our rear.

Avenues of approach

On the north flank, NIEDERBEISHEIM-HOMBERG-BORKEN is a primary corridor. The EFZE River valley from REMSFELD northeast provides a secondary corridor into HOMBERG. Primary flanking corridors into the open ground west of HOMBERG are MOSHEIM (NB3360)-MARDORF (NB2855) from the north and SCHELLBACH-WASSMUTHSHAUSEN (NB2949)-LUTZELWIG (NB2651)in the south.

In the central sector from REMSFELD to GREBENHAGEN, only narrow avenues exist. Enemy penetration into the north-south corridor between WASSMUTHSHAUSEN and HERGETSFELD would open up 3 narrow corridors for him into the FRIELENDORF area.

On the south flank, KIRCHEIM (NB4032)-OBERAULA (NB3334)-NEUKIRCHEN is the primary avenue in 52 MID sector into TREYSA. SCHWARZENBORN-SEIGERTSHAUSEN is a minor corridor but enemy movement SW from SCHWARZENBORN could threaten NEUKIRCHEN from the north. Primary flanking corridors into the TREYSA area are HOMBERG-FRIELENDORF from the north and ALSFELD (NB1922)-SCHRECKSBACH (NB2031) from the south.

(2) EFFECT ON ENEMY COURSES OF ACTION

Terrains favors enemy attack in north around HOMBERG and in south thru OBERAULA or SW thru SCHWARZENBORN. Enemy may also attempt to flank 52 MID along high speed avenue in the south from ALSFELD into TREYSA.

Enemy is currently holding excellent defensive terrain from REMSFELD south to our southern boundary. His positions west of Autobahn E4 before HOMBERG are not good defensive positions, but a withdrawal to east of AUTOBAHN E4 would provide excellent defensive terrain in the north also.

(3) EFFECT ON FRIENDLY COURSES OF ACTION

In the north around HOMBERG delay would be most difficult as withdrawal west of HOMBERG would place friendly troops in exposed positions.

In the central sector from REMSFELD to GREBENHAGEN good delaying terrain exists from 6-8 KM to the rear of current positions.

In the south between SCHWARZENBORN and HAUSEN good to fair delaying terrain exists for about 8 KM to the rear of current positions.

Defense in position is most favorable from SCHWARZENBORN south as we have a general elevation advantage and enemy must cross open terrain to attack.

In central sector, enemy generally has the elevation advantage although it is slight and not consistent along the front.

In the north around HOMBERG the city itself and the high ground we hold to the NE and SE favor a defense in position, but enemy has relatively good maneuver terrain and defendable terrain is shallow.

Only the terrain east of HOMBERG is favorable for a large-scale mounted counterattack and then only to a depth of some 5-6 KM. Nighttime infiltrations by dismounted units to seize key terrain best fits the terrain from REMSFELD south.

c. Other characteristics- REFUGEES

(1) SITUATION

The precipitous occurrence of events meant that most of the populace were unevacuated when the war began and many have been reluctant to leave until enemy shelling hits their area. This has caused refugee problems beyond the capability of military and local civilian authorities to handle. Major LOCs have been kept open but secondary roads are often clogged.

(2) EFFECT ON ENEMY COURSES OF ACTION

Enemy advances have often overtaken groups of civilians, especially during rapid advances yesterday, thus; the enemy has been hampered by the refugee problem as we have. Enemy has also taken advantage of the problem by infiltrating groups of special forces with the refugees. One reliable source says that at least 20 teams of from 2-5 men/women saboteurs and assassins from the Central Front Spetsnaz Brigade have thus infiltrated 52 MID lines

in the past 48 hours; others from KGB and other Spetsnaz groups may have done likewise.

(3) EFFECT ON FRIENDLY COURSES OF ACTION

Civilian traffic on secondary roads has occasionally hampered the rearward movement of combat troops but the primary effect has been on resupply of forward units. Increased involvement by civilian authorities seems to be easing the problem.

ENEMY PECULIARITIES/WEAKNESSES

(1) PERSONNEL

Strength of 71 GMRD & 128 MRD in first echelon probably 80% or less in all maneuver units. Morale is apparently high except in those units seeing the heaviest action; 62 MRR in HOMBERG area and 46 MRR in front of SCHWARZENBORN.

(2) INTELLIGENCE

Enemy has apparently had some success intercepting our voice and electronic communications as evidenced by his success in locating our CPs and trains. Capture of enemy observation posts at two widely separate locations 15-20 KM behind our lines suggest a more expansive HUMINT network. Known enemy COMINT capability suggests use of friendly deception.

(3) OPERATIONS

Enemy units in contact are believed not capable of further prolonged offensive operations with possible exception of 51 MRR in the south around OBERAULA. 9 GTD in 10 CAA second echelon could continue the offensive for maybe 24 hours without relief/resupply.

(4) LOGISTICS

Successful friendly attack on 10 CAA main rail line and movement of 7 TA into 10 CAA rear appear to have created severe resupply problems for 10 CAA which should be evident today and should last for 24-48 hours. Effects are greatest on frontline units of 71 GMRD & 128 MRD. 9 GTD believed to have been at least partially resupplied prior to moving west of the FULDA River last night.

(5) CIVIL-MILITARY OPERATIONS

No known enemy large-scale impressment of FRG civilian labor to date. No known organized civilian resistance in 10 CAA rear to date.

ENEMY CAPABILITIES

a. Enumeration

Attack across our division front at any time with two tank regiments and elements of six motorized rifle regiments supported by normal divisional and regimental artillery with main effort along avenue of approach BAD HERZFELD (NB5035)-OBERAULA-NEUKIRCHEN-TREYSA.

Attack across our division front at any time with two tank regiments and elements of six motorized rifle regiments supported by normal divisional and regimental artillery with main effort along avenue of approach OBERBEISHEIM-HOMBERG-BORKEN.

Defend in his present position with forces in contact supported by normally available divisional and regimental artillery.

Reinforce defense or attack at any time with three tank regiments and one MRR of 9 GTD and other reinforcing units.

Employ chemical agents in our sector at any time.

Employ nuclear weapons of 0.5 KT to 50 KT yield at any time with delivery by artillery, surface-to-surface missiles, or tactical air.

Employ airmobile assault forces in our rear either alone or in conjunction with capabilities enumerated above.

Attack our area with an undetermined number of fighter, ground attack, and bomber sorties daily. Maximum number of daily sorties mounted in our sector has been 64.

10th Combined Arms Army (CAA)

9th Guards Tank Division (GTD)

81st Tank Regiment (TR)
- 1-81 TB
- 2-81 TB
- 3-81 TB
- 4-81 MRB
- 55 ARTY BN

83rd Tank Regiment (TR)
- 1-83 TB
- 2-83 TB
- 3-83 TB
- 4-83 MRB
- 88 ARTY BN

87th Tank Regiment (TR)
- 1-87 TB
- 2-87 TB
- 3-87 TB
- 4-87 MRB
- 93 ARTY BN

223rd Motorized Rifle Regiment (MRR)
- 1-223 MRB
- 2-223 MRB
- 3-223 MRB
- 4-223 TB
- 117 ARTY BN

41st Artillery Regiment
- 73 ARTY BN
- 118 ARTY BN
- 201 ARTY BN
- 11 MRL BN

57th FROG BN

344th RECON BN

9th ENG BN

33rd HCPT SQN

18th SAM Regiment
- A/18 SAM BTY
- B/18 SAM BTY
- C/18 SAM BTY
- D/18 SAM BTY
- E/18 SAM BTY

71st Guards Motorized Rifle Division (GMRD)

62nd Motorized Rifle Regiment (MRR)
- 1-62 MRB
- 2-62 MRB
- 3-62 MRB
- 4-62 TB
- 41 ARTY BN

65th Motorized Rifle Regiment (MRR)
- 1-65 MRB
- 2-65 MRB
- 3-65 MRB
- 4-65 TB
- 53 ARTY BN

76th Motorized Rifle Regiment (MRR)
- 1-76 MRB
- 2-76 MRB
- 3-76 MRB
- 4-76 TB
- 103 ARTY BN

11th Tank Regiment (TR)
- 1-11 TB
- 2-11 TB
- 3-11 TB
- 35 ARTY BN

18th Artillery Regiment
- 49 ARTY BN
- 57 ARTY BN
- 183 ARTY BN
- 25 ARTY BN
- 21 MRL BN

15th FROG BN

17th AT BN

32nd RECON BN

71st ENG BN

22nd HCPT SQN

13th SAM Regiment
- A/13 SAM BTY
- B/13 SAM BTY
- C/13 SAM BTY
- D/13 SAM BTY
- E/13 SAM BTY

128th Motorized Rifle Division (MRD)

40th Motorized Rifle Regiment (MRR)
- 1-40 MRB
- 2-40 MRB
- 3-40 MRB
- 4-40 TB
- 116 ARTY BN

46th Motorized Rifle Regiment (MRR)
- 1-46 MRB
- 2-46 MRB
- 3-46 MRB
- 4-46 TB
- 84 ARTY BN

51st Motorized Rifle Regiment (MRR)
- 1-51 MRB
- 2-51 MRB
- 3-51 MRB
- 4-51 TB
- 227 ARTY BN

152nd Tank Regiment (TR)
- 1-152 TB
- 2-152 TB
- 3-152 TB
- 19 ARTY BN

83rd Artillery Regiment
- 20 ARTY BN
- 108 ARTY BN
- 239 ARTY BN
- 47 MRL BN

103rd FROG BN

44th AT BN

122nd RECON BN

128th ENG BN

82nd HCPT SQN

7th SAM Regiment
- A/7 SAM BTY
- B/7 SAM BTY
- C/7 SAM BTY
- D/7 SAM BTY
- E/7 SAM BTY

74th Artillery Regiment
- 31 ARTY BN
- 33 ARTY BN
- 18 ARTY BN
- 39 ARTY BN
- 9 MRL BN

11th SAM Brigade
- 1-11 SAM BN
- 2-11 SAM BN
- 3-11 SAM BN

7th SSM Brigade
- 1-7 SSM BN
- 2-7 SSM BN
- 3-7 SSM BN

8th MRL Regiment
- 36 MRL BN
- 39 MRL BN
- 40 MRL BN

10th ENG Regiment
- 1-10 ENG BN
- 2-10 ENG BN
- 3-10 ENG BN
- 4-10 CONST BN

10th CAA ARTILLERY SUMMARY

UNIT	HOW 122T	HOW 122SP	GUN 130T	G/H 152T	HOW 152T	HOW 152SP	GUN 180T	MRL 122	MRL 240	FROG	SS-23
71 GMRD	4 BN	2 BN		1 BN		1 BN		1 BN		1 BN	
128 MRD	5 BN	1 BN				1 BN		1 BN		1 BN	
9 GTD	5 BN	1 BN				1 BN		1 BN		1 BN	
74 ARTY REGT			3 BN	1 BN					1 BN		
8 MRL REGT								3 BN			
7 SSM BDE											3 BN

9 GTD

ARTILLERY BATTALION

WEAPONS (PER BN) UNIT	HOW 122 T (18)	HOW 122 SP (18)	G/H 152 T (18)	HOW 152 SP (18)	MRL 122 (18)	FROG (4)
81 MTR	55 ARTY					
83 MTR	88 ARTY					
87 MTR	93 ARTY					
223 MRR		117 ARTY				
9 DAG	73 ARTY					
	118 ARTY					
				201 ARTY		
					11 MRL	
						57 FROG

71 GMRD

ARTILLERY BATTALION

WEAPONS (PER BN) UNIT	HOW 122T (18)	HOW 122SP (18)	G/H 152T (18)	HOW 152SP (18)	MRL 122 (18)	FROG (4)
62 MRR		41 ARTY				
65 MRR		53 ARTY				
76 MRR	103 ARTY					
11 MTR	35 ARTY					
71 DAG	49 ARTY					
	57 ARTY					
				183 ARTY		
			25 ARTY			
					21 MRL	
						15 FROG

128 MRD

	ARTILLERY BATTALION					
WEAPONS (PER BN)	HOW 122T	HOW 122SP	G/H 152T	HOW 152SP	MRL 122	FROG
UNIT	(18)	(18)	(18)	(18)	(18)	(4)
40 MRR	116 ARTY					
46 MRR	84 ARTY					
51 MRR		227 ARTY				
152 MTR	19 ARTY					
128 DAG	20 ARTY					
	108 ARTY					
				239 ARTY		
					47 MRL	
						103 FROG

74 ARTY REGT

	ARTILLERY BATTALION					
WEAPONS (PER BN)	GUN 203SP	GUN 130T	G/H 152T	HOW 152SP	MRL 122	MRL 240
UNIT	(UNK)	(18)	(18)	(18)	(18)	(4)
74 ARTY REGT			39 ARTY			
		18 ARTY				
		31 ARTY				
		33 ARTY				
						9 MRL

8 MRL REGT

	ARTILLERY BATTALION					
WEAPONS (PER BN)	GUN 203SP	GUN 130T	G/H 152T	HOW 152SP	MRL 122	MRL 240
UNIT	(UNK)	(18)	(18)	(18)	(18)	(4)
8 MRL REGT					36 MRL BN	
					39 MRL BN	
					40 MRL BN	

7th Tank Army (TA)

3rd Guards Tank Division (GTD)
9 TR
13 TR
18 TR
36 MRR

6th Guards Tank Division (GTD)
25 TR
27 TR
30 TR
53 MRR

17th Tank Division (TD)

58 TR
63 TR
64 TR
97 MRR

50th Motorized Rifle Division (MRD)
82 MRR
86 MRR
91 MRR
32 TR

CENTRAL FRONT TROOPS

4th Airmobile Brigade

Shortening of 52 MID lines means that we are now facing only units from the 10 CAA. Three divisions have been identified as composing the 10 CAA: 71 GMRD is committed on our left, 128 MRD is committed on our right, and elements of the 9 GTD have apparently crossed the FULDA last night and all indications are that it is positioned generally along the ROTENBURG (NB5049)- BEBRA (NB5547) Highway some 17 KM to the rear. An additional tank army, tentatively identified as the 7 TA, is moving up to in the rear of 10 CAA; its vanguard is now west of EISENACH (NB9348), some 60 KM to the rear.

Pages A-24 to A-28 present the enemy force dispositions provided to Group A

ENEMY LOCATIONS as of 190600 AUG

UNIT NAME	UNIT LOCATION
9 GTD	
81 TR	NB 554 473
83 TR	NB 546 453
87 TR	NB 540 495
223 MRR	NB 510 500
41 ARTY REGT	
73 ARTY BN	NB 594 449
118 ARTY BN	?
201 ARTY BN	?
11 MRL BN	?
57 FROG BN	?
344 RECON BN	?
9 ENG BN	?
33 HCPT SQN	?
18 SAM REGT	
A/18 SAM BTY	?
B/18 SAM BTY	?
C/18 SAM BTY	NB 485 463
D/18 SAM BTY	NB 510 435
E/18 SAM BTY	?

UNIT NAME	UNIT LOCATION
71 GMRD	NB 520 493
62 MRR	NB 365 539
1-62 MRB	NB 349 545
2-62 MRB	NB 344 525
3-62 MRB	NB 341 555
4-62 TB	NB 351 540
41 ARTY BN	NB 415 540
65 MRR	NB 370 500
1-65 MRB	NB 359 514
2-65 MRB	NB 345 505
3-65 MRB	NB 344 490
4-65 TB	NB 350 500
53 ARTY BN	NB 399 510
76 MRR	NB 370 455
1-76 MRB	NB 344 475
2-76 MRB	NB 347 457
3-76 MRB	NB 346 440
4-76 TB	NB 355 460
103 ARTY BN	NB 405 466
11 TR	NB 400 545
1-11 TB	NB 394 555
2-11 TB	NB 390 530
3-11 TB	NB 400 535
35 ARTY BN	NB 409 534
18 ART REGT	?
49 ARTY BN	NB 435 485
57 ARTY BN	NB 409 454
183 ARTY BN	?
25 ART BN	?
21 MRL BN	?
15 FROG BN	?
17 AT BN	?
A/17 AT CO	NB 354 530
32 RECON BN	?
71 ENG BN	?
22 HCPT SQN	NB 650 439
13 SAM REGT	?
A/13 SAM BTY	?
B/13 SAM BTY	?
C/13 SAM BTY	?
D/13 SAM BTY	?
E/13 SAM BTY	?

UNIT NAME	UNIT LOCATION
128 MRD	NB 507 370
40 MRR	NB 370 420
1-40 MRB	NB 349 412
2-40 MRB	NB 349 430
3-40 MRB	NB 346 420
4-40 TB	NB 355 422
116 ARTY BN	NB 400 430
46 MRR	NB 365 390
1-46 MRB	NB 345 398
2-46 MRB	NB 380 410
3-46 MRB	NB 339 380
4-46 TB	NB 375 407
84 ARTY BN	NB 405 395
51 MRR	NB 360 345
1-51 MRB	NB 349 368
2-51 MRB	NB 337 357
3-51 MRB	NB 344 325
4-51 TB	NB 345 334
227 ARTY BN	NB 383 332
152 TR	NB 405 325
1-152 TB	?
2-152 TB	?
3-152 TB	?
19 ARTY BN	NB 395 323
83 ARTY REGT	?
20 ARTY BN	NB 410 360
108 ARTY BN	NB 400 345
239 ARTY BN	NB 465 395
47 MRL BN	?
103 FROG BN	NB 630 395
44 AT BN	NB 385 325
122 RECON BN	?
128 ENG BN	?
82 HCPT SQN	?
7 SAM REGT	?
A/7 SAM BTY	?
B/7 SAM BTY	?
C/7 SAM BTY	?
D/7 SAM BTY	?
E/7 SAM BTY	?

UNIT NAME	UNIT LOCATION
74 ARTY REGT	?
31 ARTY BN	?
33 ARTY BN	?
18 ARTY BN	NB 446 463
39 ARTY BN	?
9 MRL BN	?
11 SAM BDE	?
1-11 SAM BN	?
2-11 SAM BN	?
3-11 SAM BN	NB 579 420
7 SSM BDE	?
1-7 SSM BN	NB 906 460
2-7 SSM BN	NB 889 475
3-7 SSM BN	NB 874 454
8 MRL REGT	?
36 MRL BN	NB 520 480
39 MRL BN	NB 530 471
40 MRL BN	?
10 ENG REGT	?
1-10 ENG BN	?
2-10 ENG BN	?
3-10 ENG BN	?
4-10 CONST BN	?

Shortening of 52 MID lines means that we are now facing only units from the 10 CAA. Three divisions have been identified as composing the 10 CAA: 71 GMRD is committed on our left, 128 MRD is committed on our right, and 9 GTD has apparently crossed the FULDA last night and all indications are that it is positioned generally along the BAD HERSFELD (NB5036)-BEBRA (NB5647) Highway some 17 KM to the rear. An additional tank army, tentatively identified as the 7 TA, is moving up to in the rear of 10 CAA; its vanguard is now just west of EISENACH (NB9348), some 60 KM to the rear.

Pages A-29 to A-33 present the enemy force dispositions provided to Group B

LAST REPORTED ENEMY LOCATIONS as of 190600 AUG

UNIT NAME	UNIT LOCATION
9 GTD	
81 TR	NB 517 390
83 TR	NB 501 363
87 TR	NB 525 409
223 MRR	NB 540 429
41 ARTY REGT	
73 ARTY BN	NB 594 449
118 ARTY BN	?
201 ARTY BN	?
11 MRL BN	?
57 FROG BN	?
344 RECON BN	?
9 ENG BN	?
33 HCPT SQN	?
18 SAM REGT	
A/18 SAM BTY	?
B/18 SAM BTY	?
C/18 SAM BTY	NB 485 463
D/18 SAM BTY	NB 510 435
E/18 SAM BTY	?

UNIT NAME	UNIT LOCATION
71 GMRD	NB 520 493
62 MRR	
1-62 MRB	NB 349 545
2-62 MRB	NB 344 525
3-62 MRB	NB 341 555
4-62 TB	NB 351 540
41 ARTY BN	NB 415 540
65 MRR	
1-65 MRB	NB 359 514
2-65 MRB	NB 345 505
3-65 MRB	NB 344 490
4-65 TB	NB 350 500
53 ARTY BN	NB 399 510
76 MRR	
1-76 MRB	NB 344 475
2-76 MRB	NB 347 457
3-76 MRB	NB 346 440
4-76 TB	NB 355 460
103 ARTY BN	NB 405 466
11 TR	NB 400 545
1-11 TB	?
2-11 TB	?
3-11 TB	?
35 ARTY BN	NB 409 534
18 ARTY REGT	?
49 ARTY BN	NB 435 485
57 ARTY BN	NB 409 454
183 ARTY BN	?
25 ARTY BN	?
21 MRL BN	?
15 FROG BN	?
17 AT BN	?
A/17 AT CO	NB 354 530
32 RECON BN	?
71 ENG BN	?
22 HCPT SQN	NB 650 439
13 SAM REGT	?
A/13 SAM BTY	?
B/13 SAM BTY	?
C/13 SAM BTY	?
D/13 SAM BTY	?
E/13 SAM BTY	?

UNIT NAME	UNIT LOCATION
128 MRD	NB 507 370
40 MRR	
1-40 MRB	NB 349 412
2-40 MRB	NB 349 430
3-40 MRB	NB 346 420
4-40 TB	NB 355 422
116 ARTY BN	NB 400 430
46 MRR	
1-46 MRB	NB 345 398
2-46 MRB	NB 380 410
3-46 MRB	NB 339 380
4-46 TB	NB 375 407
84 ARTY BN	NB 405 395
51 MRR	
1-51 MRB	NB 349 368
2-51 MRB	NB 337 357
3-51 MRB	NB 344 325
4-51 TB	NB 345 334
227 ARTY BN	NB 383 332
152 TR	NB 405 325
1-152 TB	?
2-152 TB	?
3-152 TB	?
19 ARTY BN	NB 395 323
83 ARTY REGT	?
20 ARTY BN	NB 410 360
108 ARTY BN	NB 400 345
239 ARTY BN	NB 465 395
47 MRL BN	?
103 FROG BN	NB 630 395
44 AT BN	NB 385 325
122 RECON BN	?
128 ENG BN	?
82 HCPT SQN	?
7 SAM REGT	?
A/7 SAM BTY	?
B/7 SAM BTY	?
C/7 SAM BTY	?
D/7 SAM BTY	?
E/7 SAM BTY	?

UNIT NAME	UNIT LOCATION
74 ARTY REGT	?
31 ARTY BN	?
33 ARTY BN	?
18 ARTY BN	NB 473 385
39 ARTY BN	?
9 MRL BN	?
11 SAM BDE	?
1-11 SAM BN	?
2-11 SAM BN	?
3-11 SAM BN	NB 579 420
7 SSM BDE	?
1-7 SSM BN	NB 906 460
2-7 SSM BN	NB 889 475
3-7 SSM BN	NB 874 454
8 MRL REGT	?
36 MRL BN	NB 463 414
39 MRL BN	NB 477 423
40 MRL BN	?
10 ENG REGT	?
1-10 ENG BN	?
2-10 ENG BN	?
3-10 ENG BN	?
4-10 CONST BN	?

Shortening of 52 MID lines means that we are now facing only units from the 10 CAA. Three divisions have been identified as composing the 10 CAA: 71 GMRD is committed on our left, 128 MRD is committed on our right, and elements of the 9 GTD have apparently crossed the FULDA last night and all indications are that it is positioned generally along the FRIEDLOS (NB5239)- BEBRA (NB5547) Highway some 17 KM to the rear. An additional tank army, tentatively identified as the 7 TA, is moving up to in the rear of 10 CAA; its vanguard is now west of EISENACH (NB9348), some 60 KM to the rear.

Pages A-34 to A-38 present the enemy force dispositions provided to Group C

ENEMY LOCATIONS as of 190600 AUG

UNIT NAME	UNIT LOCATION
9 GTD	
81 TR	NB 540 429
83 TR	NB 525 409
87 TR	NB 546 453
223 MRR	NB 554 473
41 ARTY REGT	
73 ARTY BN	NB 594 449
118 ARTY BN	?
201 ARTY BN	?
11 MRL BN	?
57 FROG BN	?
344 RECON BN	?
9 ENG BN	?
33 HCPT SQN	?
18 SAM REGT	
A/18 SAM BTY	?
B/18 SAM BTY	?
C/18 SAM BTY	NB 485 463
D/18 SAM BTY	NB 510 435
E/18 SAM BTY	?

UNIT NAME	UNIT LOCATION
71 GMRD	NB 520 493
62 MRR	NB 365 539
1-62 MRB	NB 349 545
2-62 MRB	NB 344 525
3-62 MRB	NB 341 555
4-62 TB	NB 351 540
41 ARTY BN	NB 415 540
65 MRR	NB 370 500
1-65 MRB	NB 359 514
2-65 MRB	NB 345 505
3-65 MRB	NB 344 490
4-65 TB	NB 350 500
53 ARTY BN	NB 399 510
76 MRR	NB 370 455
1-76 MRB	NB 344 475
2-76 MRB	NB 347 457
3-76 MRB	NB 346 440
4-76 TB	NB 355 460
103 ARTY BN	NB 405 466
11 TR	NB 400 545
1-11 TB	NB 394 555
2-11 TB	NB 390 530
3-11 TB	NB 400 535
35 ARTY BN	NB 409 534
18 ARTY REGT	?
49 ARTY BN	NB 435 485
57 ARTY BN	NB 409 454
183 ARTY BN	?
25 ARTY BN	?
21 MRL BN	?
15 FROG BN	?
17 AT BN	?
A/17 AT CO	NB 354 530
32 RECON BN	?
71 ENG BN	?
22 HCPT SQN	NB 650 439
13 SAM REGT	?
A/13 SAM BTY	?
B/13 SAM BTY	?
C/13 SAM BTY	?
D/13 SAM BTY	?
E/13 SAM BTY	?

UNIT NAME	UNIT LOCATION
128 MRD	NB 507 370
40 MRR	NB 370 420
1-40 MRB	NB 349 412
2-40 MRB	NB 349 430
3-40 MRB	NB 346 420
4-40 TB	NB 355 422
116 ARTY BN	NB 400 430
46 MRR	NB 365 390
1-46 MRB	NB 345 398
2-46 MRB	NB 380 410
3-46 MRB	NB 339 380
4-46 TB	NB 375 407
84 ARTY BN	NB 405 395
51 MRR	NB 360 345
1-51 MRB	NB 349 368
2-51 MRB	NB 337 357
3-51 MRB	NB 344 325
4-51 TB	NB 345 334
227 ARTY BN	NB 383 332
152 TR	NB 405 325
1-152 TB	?
2-152 TB	?
3-152 TB	?
19 ARTY BN	NB 395 323
83 ARTY REGT	?
20 ARTY BN	NB 410 360
108 ARTY BN	NB 400 345
239 ARTY BN	NB 465 395
47 MRL BN	?
103 FROG BN	NB 630 395
44 AT BN	NB 385 325
122 RECON BN	?
128 ENG BN	?
82 HCPT SQN	?
7 SAM REGT	?
A/7 SAM BTY	?
B/7 SAM BTY	?
C/7 SAM BTY	?
D/7 SAM BTY	?
E/7 SAM BTY	?

UNIT NAME	UNIT LOCATION
74 ARTY REGT	?
31 ARTY BN	?
33 ARTY BN	?
18 ARTY BN	NB 473 385
39 ARTY BN	?
9 MRL BN	?
11 SAM BDE	?
1-11 SAM BN	?
2-11 SAM BN	?
3-11 SAM BN	NB 579 420
7 SSM BDE	?
1-7 SSM BN	NB 906 460
2-7 SSM BN	NB 889 475
3-7 SSM BN	NB 874 454
8 MRL REGT	?
36 MRL BN	NB 520 480
39 MRL BN	NB 530 471
40 MRL BN	?
10 ENG REGT	?
1-10 ENG BN	?
2-10 ENG BN	?
3-10 ENG BN	?
4-10 CONST BN	?

It is apparent now that the two MRD in contact have been pressing the fight with their MR regiments the past 24 hours, meaning that 52 MID is currently facing six MR regiments each with an organic tank battalion. This means that there are two tank regiments reinforcing plus the entire 9 GTD in the 10 CAA. In addition, 7 TA is sufficiently close to our FEBA to be considered as reinforcing in our sector. We estimate that in excess of 35 enemy FA and missile battalions have been used against 52 MID for the past 48 hours.

ENEMY FORCES EQUIPMENT ESTIMATE (190600 AUG)

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
9 GTD	8	80	51	ACV	106	52	AICV BMP	240
			53	APC BTR	31	55	APC RAD	9
			56	ASC BRDM	28	57	BRDM GM	9
			59	TANK T64	282	60	TANK T72	46
			61	MORT 120	36	63	HOW 122T	90
			64	HOW 122S	18	67	HOW 152S	18
			70	MRL 122	18	72	FROG 7	4
			76	ZSU 23-4	16	78	SA-6	20
			80	SA-9	16	81	HCPT OBS	6
			82	HCPT AST	6	83	HCPT ATK	6
			85	BRG TKLH	10	86	BRG TRLH	24
			87	TRK 5T	658	88	TRK HV	629
			89	TRK POL	240	90	ACRV	16
81 TR	8	85	51	ACV	17	52	AICV BMP	39
			53	APC BTR	5	55	APC RAD	1
			56	ASC BRDM	4	59	TANK T64	94
			61	MORT 120	6	63	HOW 122T	18
			76	ZSU 23-4	4	80	SA-9	4
			85	BRG TKLH	3	86	BRG TRLH	4
			87	TRK 5T	104	88	TRK HV	47
			89	TRK POL	28			
1-81 TBN	8	85	51	ACV	2	59	TANK T64	31
			87	TRK 5T	7	89	TRK POL	3
2-81 TBN	8	85	51	ACV	2	59	TANK T64	31
			87	TRK 5T	7	89	TRK POL	3
3-81 TBN	8	85	51	ACV	2	59	TANK T64	31
			87	TRK 5T	7	89	TRK POL	3
4-81 MRBN	8	85	51	ACV	3	52	AICV BMP	36
			53	APC BTR	5	61	MORT 120	6
			87	TRK 5T	13	88	TRK HV	4
			89	TRK POL	2			
55 ARTY BN	0	90	51	ACV	1	63	HOW 122T	18
			87	TRK 5T	12	88	TRK HV	34
			89	TRK POL	2			

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
83 TR	8	80	51	ACV	17	52	AICV BMP	39
			53	APC BTR	5	55	APC RAD	1
			56	ASC BRDM	4	59	TANK T64	94
			61	MORT 120	6	63	HOW 122T	18
			76	ZSU 23-4	4	80	SA-9	4
			85	BRG TKLH	3	86	BRG TRLH	4
			87	TRK 5T	104	88	TRK HV	47
			89	TRK POL	28			
1-83 TBN	8	80	51	ACV	2	59	TANK T64	31
			87	TRK 5T	7	89	TRK POL	3
2-83 TBN	8	75	51	ACV	2	59	TANK T64	31
			87	TRK 5T	7	89	TRK POL	3
3-83 TBN	8	80	51	ACV	2	59	TANK T64	31
			87	TRK 5T	7	89	TRK POL	3
4-83 MRBN	8	80	51	ACV	3	52	AICV BMP	36
			53	APC BTR	5	61	MORT 120	6
			87	TRK 5T	13	88	TRK HV	4
			89	TRK POL	2			
88 ARTY BN	0	65	51	ACV	1	63	HOW 122T	18
			87	TRK 5T	12	88	TRK HV	34
			89	TRK POL	2			
87 TR	8	85	51	ACV	17	52	AICV BMP	39
			53	APC BTR	5	55	APC RAD	1
			56	ASC BRDM	4	59	TANK T64	94
			61	MORT 120	6	63	HOW 122T	18
			76	ZSU 23-4	4	80	SA-9	4
			85	BRG TKLH	3	86	BRG TRLH	4
			87	TRK 5T	104	88	TRK HV	47
			89	TRK POL	28			
1-87 TBN	8	85	51	ACV	2	59	TANK T64	31
			87	TRK 5T	7	89	TRK POL	3
2-87 TBN	8	85	51	ACV	2	59	TANK T64	31
			87	TRK 5T	7	89	TRK POL	3
3-87 TBN	8	85	51	ACV	2	59	TANK T64	31
			87	TRK 5T	7	89	TRK POL	3
4-87 MRBN	8	85	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
			53	APC BTR	5			
93 ARTY BN	0	85	51	ACV	1	63	HOW 122T	18
			87	TRK 5T	12	88	TRK HV	34
			89	TRK POL	2			

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
223 MRR	8	75	51	ACV	23	52	AICV BMP	111
			53	APC BTR	10	55	APC RAD	1
			56	ASC BRDM	4	57	BRDM GM	9
			60	TANK T72	40	61	MORT 120	18
			64	HOW 122S	18	76	ZSU 23-4	4
			80	SA-9	4	85	BRG TKLH	1
			86	BRG TRLH	4			
1-223 MRBN	8	80	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
2-223 MRBN	8	80	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
3-223 MRBN	8	75	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
4-223 TBN	8	80	51	ACV	2	60	TANK T72	40
			87	TRK 5T	7	89	TRK POL	3
117 ARTY BN	0	70	55	APC RAD	1	64	HOW 122S	18
			87	TRK 5T	7	88	TRK HV	20
			89	TRK POL	2	90	ACRV	8
73 ARTY BN	0	90	51	ACV	1	55	APC RAD	1
			63	HOW 122T	18	87	TRK 5T	12
			88	TRK HV	34	89	TRK POL	2
118 ARTY BN	0	75	51	ACV	1	55	APC RAD	1
			63	HOW 122T	18	87	TRK 5T	12
			88	TRK HV	34	89	TRK POL	2
201 ARTY BN	0	75	55	APC RAD	1	67	HOW 152S	18
			87	TRK 5T	7	88	TRK HV	20
			89	TRK POL	2	90	ACRV	8
11 MRL BN	0	75	51	ACV	1	70	MRL 122	18
			87	TRK 5T	14	88	TRK HV	36
			89	TRK POL	2			
57 FROG BN	0	75	72	FROG 7	4	87	TRK 5T	6
			88	TRK HV	8	89	TRK POL	2
344 RECON BN	8	35	51	ACV	6	52	AICV BMP	12
			56	ASC BRDM	12	60	TANK T72	6
			87	TRK 5T	7	88	TRK HV	4
			89	TRK POL	2			

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
9 ENG BN	8	60	53	APC BTR	3	41	BRG PMP	1
			42	TRK FRRY GSP	6	43	TRK AMPHB	12
			86	BRG TRLH (TMM)	8	88	TRK HV	22
33 HCPT SQN	8	30	81	HCPT OBS	6	82	HCPT AST	6
			83	HCPT ATK	6			
A/18 SAM BTY	0	75	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			
B/18 SAM BTY	0	75	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			
C/18 SAM BTY	0	75	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			
D/18 SAM BTY	0	75	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			
E/18 SAM BTY	0	75	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
71 GMRD	0	65	51	ACV	121	52	AICV BMP	237
			53	APC BTR	152	54	APC MTLB	14
			55	APC RAD	9	56	ASC BRDM	28
			57	BRDM GM	36	59	TANK T64	214
			60	TANK T72	6	61	MORT 120	54
			62	GUN 100T	12	63	HOW 122T	72
			64	HOW 122S	36	67	HOW 152S	18
			70	MRL 122	18	72	FROG 7	4
			76	ZSU 23-4	16	78	SA-6	20
			80	SA-9	16	81	HCPT OBS	6
			82	HCPT AST	6	83	HCPT ATK	6
			85	BRG TKLH	6	86	BRG TRLH	24
			87	TRK 5T	601	88	TRK HV	712
			89	TRK POL	236	90	ACRV	24
62 MRR	0	65	51	ACV	23	52	AICV BMP	111
			53	APC BTR	10	55	APC RAD	1
			56	ASC BRDM	4	57	BRDM GM	9
			59	TANK T64	40	61	MORT 120	18
			64	HOW 122S	18	76	ZSU 23-4	4
			80	SA-9	4	85	BRG TKLH	1
			86	BRG TRLH	4	87	TRK 5T	71
			88	TRK HV	90	89	TRK POL	26
			90	ACRV	8			
1-62 MRBN	0	65	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
2-62 MRBN	0	70	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
3-62 MRBN	0	65	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
4-62 TBN	0	55	51	ACV	2	59	TANK T64	40
			87	TRK 5T	7	89	TRK POL	3
41 ARTY BN	0	55	55	APC RAD	1	64	HOW 122S	18
			87	TRK 5T	7	88	TRK HV	20
			89	TRK POL	2	90	ACRV	8

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
65 MRR	0	65	51	ACV	23	52	AICV BMP	111
			53	APC BTR	10	55	APC RAD	1
			56	ASC BRDM	4	57	BRDM GM	9
			59	TANK T64	40	61	MORT 120	18
			64	HOW 122S	18	76	ZSU 23-4	4
			80	SA-9	4	85	BRG TKLH	1
			86	BRG TRLH	4	87	TRK 5T	71
			88	TRK HV	90	89	TRK POL	26
			90	ACRV	8			
1-65 MRBN	0	65	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
2-65 MRBN	0	70	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
3-65 MRBN	0	65	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
4-65 TBN	0	60	51	ACV	2	59	TANK T64	40
			87	TRK 5T	7	89	TRK POL	3
53 ARTY BN	0	60	55	APC RAD	1	64	HOW 122S	18
			87	TRK 5T	7	88	TRK HV	20
			89	TRK POL	2	90	ACRV	8
76 MRR	0	70	51	ACV	24	52	AICV BMP	3
			53	APC BTR	121	55	APC RAD	1
			56	ASC BRDM	4	57	BRDM GM	9
			59	TANK T64	40	61	MORT 120	18
			63	HOW 122T	18	76	ZSU 23-4	4
			80	SA-9	4	85	BRG TKLH	1
			86	BRG TRLH	4	87	TRK 5T	8(
			88	TRK HV	104	89	TRK POL	2(
1-76 MRBN	0	80	51	ACV	3	53	APC BTR	3
			61	MORT 120	6	87	TRK 5T	1
			88	TRK HV	4	89	TRK POL	
2-76 MRBN	0	75	51	ACV	3	53	APC BTR	3
			61	MORT 120	6	87	TRK 5T	1
			88	TRK HV	4	89	TRK POL	
3-76 MRBN	0	70	51	ACV	3	53	APC BTR	
			61	MORT 120	6	87	TRK 5T	
			88	TRK HV	4	89	TRK POL	
4-76 MTBN	0	60	51	ACV	2	59	TANK T64	
			87	TRK 5T	7	89	TRK POL	

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
103 ARTY BN	0	60	55	APC RAD	1	63	HOW 122T	18
			87	TRK 5T	12	88	TRK HV	34
			89	TRK POL	2			
11 TR	4	70	51	ACV	14	52	AICV BMP	3
			53	APC BTR	5	55	APC RAD	1
			56	ASC BRDM	4	59	TANK T64	94
			63	HOW 122T	18	76	ZSU 23-4	4
			80	SA-9	4	85	BRG TKLH	3
			86	BRG TRLH	4	87	TRK 5T	91
			88	TRK HV	50	89	TRK POL	26
1-11 TBN	4	65	51	ACV	2	59	TANK T64	31
			87	TRK 5T	7	89	TRK POL	3
2-11 TBN	4	70	51	ACV	2	59	TANK T64	31
			87	TRK 5T	7	89	TRK POL	3
3-11 TBN	4	70	51	ACV	2	59	TANK T64	31
			87	TRK 5T	7	89	TRK POL	3
35 ARTY BN	0	85	51	ACV	1	55	APC RAD	1
			63	HOW 122T	18	87	TRK 5T	12
			88	TRK HV	34	89	TRK POL	2
49 ARTY BN	0	80	51	ACV	1	55	APC RAD	1
			63	HOW 122T	18	87	TRK 5T	12
			88	TRK HV	34	89	TRK POL	2
57 ARTY BN	0	65	51	ACV	1	55	APC RAD	1
			63	HOW 122T	18	87	TRK 5T	12
			88	TRK HV	34	89	TRK POL	2
183 ARTY BN	0	70	55	APC RAD	1	67	HOW 152SP	18
			87	TRK 5T	7	88	TRK HV	20
			89	TRK POL	2	90	ACRV	8
25 ARTY BN	0	65	68	G/H 152T	18			
21 MRL BN	0	0	51	ACV	1	70	MRL 122	18
			87	TRK 5T	14	88	TRK HV	36
			89	TRK POL	2			
15 FROG BN	0	0	72	FROG 7	4	87	TRK 5T	6
			88	TRK HV	8	89	TRK POL	2
17 AT BN	0	90	51	ACV	5	54	APC MTLB	14
			57	BRDM GM	9	62	GUN 100T	12
			87	TRK 5T	15	88	TRK HV	1
			89	TRK POL	2			

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
32 RECON BN	0	65	51	ACV	6	52	AICV BMP	12
			56	ASC BRDM	12	60	TANK T72	6
			87	TRK 5T	7	88	TRK HV	4
			89	TRK POL	2			
71 ENG BN	4	60	53	APC BTR	3	41	BRG PMP	1
			42	TRK FRRY GSP	6	43	TRK AMPHB	12
			86	BRG TRLH (TMM)	8	88	TRK HV	22
22 HCPT SQN	0	30	81	HCPT OBS	6	82	HCPT AST	6
			83	HCPT ATK	6			
A/13 SAM BTY	0	50	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			
B/13 SAM BTY	0	50	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			
C/13 SAM BTY	0	60	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			
D/13 SAM BTY	0	60	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			
E/13 SAM BTY	0	60	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
128 MRD	0	75	51	ACV	122	52	AICV BMP	129
			53	APC BTR	263	54	APC MTLB	14
			55	APC RAD	9	56	ASC BRDM	28
			57	BRDM GM	36	59	TANK T64	40
			60	TANK T72	180	61	MORT 120	54
			62	GUN 100T	12	63	HOW 122T	90
			64	HOW 122S	18	67	HOW 152S	18
			70	MRL 122	18	72	FROG 7	4
			76	ZSU 23-4	16	78	SA-6	20
			80	SA-9	16	81	HCPT OBS	6
			82	HCPT AST	6	83	HCPT ATK	6
			85	BRG TKLH	6	86	BRG TRLH	24
			87	TRK 5T	610	88	TRK HV	726
			89	TRK POL	236	90	ACRV	16
40 MRR	0	75	51	ACV	24	52	AICV BMP	3
			53	APC BTR	121	55	APC RAD	1
			56	ASC BRDM	4	57	BRDM GM	9
			60	TANK T72	40	61	MORT 120	18
			63	HOW 122T	18	76	ZSU 23-4	4
			80	SA-9	4	85	BRG TKLH	1
			86	BRG TRLH	4	87	TRK 5T	80
			88	TRK HV	104	89	TRK POL	26
1-40 MRBN	0	80	51	ACV	3	53	APC BTR	37
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
2-40 MRBN	0	80	51	ACV	3	53	APC BTR	37
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
3-40 MRBN	0	75	51	ACV	3	53	APC BTR	37
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
4-40 TBN	0	60	51	ACV	2	60	TANK T72	40
			87	TRK 5T	7	89	TRK POL	3
116 ARTY BN	0	60	55	APC RAD	1	63	HOW 122T	18
			87	TRK 5T	12	88	TRK HV	34
			89	TRK POL	2			

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
46 MRR	0	70	51	ACV	24	52	AICV BMP	3
			53	APC BTR	121	55	APC RAD	1
			56	ASC BRDM	4	57	BRDM GM	9
			60	TANK T72	40	61	MORT 120	18
			63	HOW 122T	18	76	ZSU 23-4	4
			80	SA-9	4	85	BRG TKLH	1
			86	BRG TRLH	4	87	TRK 5T	80
			88	TRK HV	104	89	TRK POL	26
1-46 MRBN	0	75	51	ACV	3	53	APC BTR	37
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
2-46 MRBN	0	65	51	ACV	3	53	APC BTR	37
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
3-46 MRBN	0	80	51	ACV	3	53	APC BTR	37
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4?	89	TRK POL	2
4-46 TBN	0	55	51	ACV	2	60	TANK T72	40
			87	TRK 5T	7	89	TRK POL	3
84 ARTY BN	0	55	63	HOW 122T	18	87	TRK 5T	12
			88	TRK HV	34	89	TRK POL	2
51 MRR	0	80	51	ACV	23	52	AICV BMP	111
			53	APC BTR	10	55	APC RAD	1
			56	ASC BRDM	4	57	BRDM GM	9
			59	TANK T64	40	61	MORT 120	18
			64	HOW 122S	18	76	ZSU 23-4	4
			80	SA-9	4	85	BRG TKLH	1
			86	BRG TRLH	4	87	TRK 5T	71
			88	TRK HV	90	89	TRK POL	26
			90	ACRV	8			
1-51 MRBN	0	80	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
2-51 MRBN	0	75	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
3-51 MRBN	0	80	51	ACV	3	52	AICV BMP	36
			61	MORT 120	6	87	TRK 5T	13
			88	TRK HV	4	89	TRK POL	2
4-51 TBN	0	80	51	ACV	2	59	TANK T64	40
			87	TRK 5T	7	89	TRK POL	3

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
227 ARTY BN	0	80	55	APC RAD	1	64	HOW 122S	18
			87	TRK 5T	7	88	TRK HV	20
			89	TRK POL	2	90	ACRV	8
152 TR	4	75	51	ACV	14	52	AICV BMP	3
			53	APC BTR	5	55	APC RAD	1
			56	ASC BRDM	4	60	TANK T72	94
			63	HOW 122T	18	76	ZSU 23-4	4
			80	SA-9	4	85	BRG TKLH	3
			86	BRG TRLH	4	87	TRK 5T	91
			88	TRK HV	50	89	TRK POL	26
1-152 TBN	4	75	51	ACV	2	60	TANK T72	31
			87	TRK 5T	7	89	TRK POL	3
2-152 TBN	4	80	51	ACV	2	60	TANK T72	31
			87	TRK 5T	7	89	TRK POL	3
3-152 TBN	4	80	51	ACV	2	60	TANK T72	31
			87	TRK 5T	7	89	TRK POL	3
19 ARTY BN	0	60	51	ACV	1	55	APC RAD	1
			63	HOW 122T	18	87	TRK 5T	12
			88	TRK HV	34	89	TRK POL	2
20 ARTY BN	0	75	51	ACV	1	55	APC RAD	1
			63	HOW 122T	18	87	TRK 5T	12
			88	TRK HV	34	89	TRK POL	2
108 ARTY BN	0	80	51	ACV	1	55	APC RAD	1
			63	HOW 122T	18	87	TRK 5T	12
			88	TRK HV	34	89	TRK POL	2
239 ARTY BN	0	55	55	APC RAD	1	67	HOW 152S	18
			87	TRK 5T	7	88	TRK HV	20
			89	TRK POL	2	90	ACRV	8
47 MRL BN	0	50	51	ACV	1	70	MRL 122	18
			87	TRK 5T	14	88	TRK HV	36
			89	TRK POL	2			
103 FROG BN	0	50	72	FROG 7	4	87	TRK 5T	6
			88	TRK HV	8	89	TRK POL	2
44 AT BN	0	95	51	ACV	5	54	APC MTLB	14
			57	BRDM GM	9	62	GUN 100T	12
			87	TRK 5T	15	88	TRK HV	1
			89	TRK POL	2			
122 RECON BN	0	80	51	ACV	6	52	AICV BMP	12
			56	ASC BRDM	12	60	TANK T72	6
			87	TRK 5T	7	88	TRK HV	4
			89	TRK POL	2			

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
128 ENG BN	4	60	53	APC BTR	3	41	BRG PMP	1
			42	TRK FRRY GSP	6	43	TRK AMPHB	12
			86	BRG TRLH (TMM)	8	88	TRK HV	22
82 HCPT SQN	0	25	81	HCPT OBS	6	82	HCPT AST	6
			83	HCPT ATK	6			
A/7 SAM BTY	0	50	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			
B/7 SAM BTY	0	45	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			
C/7 SAM BTY	0	55	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			
D/7 SAM BTY	0	50	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			
E/7 SAM BTY	0	50	51	ACV	1	78	SA-6	4
			87	TRK 5T	1			

UNIT NAME	REINF HOURS	% STRNGTH	EQUIP CODE	EQUIP NAME	BASIC LOAD	EQUIP CODE	EQUIP NAME	BASIC LOAD
31 ARTY BN	0	60	65	GUN 130T	18			
33 ARTY BN	0	60	65	GUN 130T	18			
18 ARTY BN	0	70	65	GUN 130T	18			
39 ARTY BN	0	45	68	G/H 152T	18			
9 MRL BN	0	70	71	MRL 240	18			
1-11 SAM BN	0	55	77	SA-4	9			
2-11 SAM BN	0	65	77	SA-4	9			
3-11 SAM BN	0	55	77	SA-4	9			
36 MRL BN	0	95	51	ACV	1	70	MRL 122	18
			87	TRK 5T	14	88	TRK HV	36
			89	TRK POL	2			
39 MRL BN	0	65	51	ACV	1	70	MRL 122	18
			87	TRK 5T	14	88	TRK HV	36
			89	TRK POL	2			
40 MRL BN	0	75	51	ACV	1	70	MRL 122	18
			87	TRK 5T	14	88	TRK HV	36
			89	TRK POL	2			
1-7 SSM BN	0	100	75	SS-23	4			
2-7 SSM BN	0	100	75	SS-23	4			
3-7 SSM BN	0	100	75	SS-23	4			
10 ENG REGT	8	70	53	APC BTR	6	41	BRG PMP	2
			42	TRK FRRY GSP	24	43	TRK AMPHB	28
			85	BRG TKLH	14	86	BRG TRLH (TMM)	20
			88	TRK HV	82			

TACTICAL DOCTRINE

The tactics of the 10th CAA have been consistent with standard Soviet tactical doctrine. The army in the first echelon of a front offensive normally has the mission to attack through enemy defenses to the immediate operational depth (the enemy corps rear area.) An army offensive normally has a frontage 60 to 100 km wide. The 10th CAA frontage is only 30 km, indicating a "bold thrust" breakthrough attempt in 52 MID area. An operational maneuver group (OMG) may be formed from army assets. However, it appears that 10th CAA has chosen to use 9th TD as a second echelon instead. An OMG from 7th TA is likely to follow. Mission of 9th TD is probably to achieve breakthrough in 52 MID sector which could be exploited by 7th TA OMG. Army offensive could also include an airmobile or heliborne assault operating in conjunction with an OMG.

TACTICS

Motorized Rifle-- MR units have tended to remain in column or march formation as much as possible to maintain speed of the offensive. Prebattle formations are used only to transition to attack formations (about 1000 meters from defended positions.) Troops dismount only when vehicle is disabled or obstacles must be cleared.

Tank-- Tanks have been attached to almost all infantry formations for support. Tanks attacking without infantry support have been reported in the 2nd BDE area.

Artillery-- Artillery fire support has been massive and effective. Artillery battalions designated to support an attack take up firing positions several hours before the attack is launched. Regimental artillery groups (RAGs) have normally been reinforced with 1 to 2 battalions from division or army assets. Divisional artillery groups (DAGs) normally have 2 to 4 battalions. Heavy use of smoke rounds starting 20 minutes before attacks has been effective at suppressing 52nd MID antitank fires. No nuclear or chemical munitions have been used.

Other-- Air strikes and heliborne operations have been much less than expected. Soviet air assets seem to have been used primarily for deep attacks up to now. Expected shift to close air support operations likely. Engineering and bridging assets used extensively for the crossing of the FULDA River on first day of combat. Many rafts and bridges reported destroyed. Expected shift to fording and snorkeling operations likely.

INDIVIDUAL

Recruit-- Summer recruits have completed 4 months training. Winter recruits have completed 10 months. General state of training in lower ranks appears high.

Specialist-- Excellent state of training.

NCO-- Excellent state of training.

Officer-- Excellent state of training.

UNIT

The units in the 10th CAA are all Category 1 (highest readiness level). Only weaknesses appear to be in coordination of air-ground operations.

CLASSES OF SUPPLY

I-- No problems observed in resupply.

III-- Forward MR divisions known to be rationing fuel. No known fuel pipelines have been successfully laid across FULDA River in 10th CAA rear.

V-- Ammunition usage has been high. However, no indications of vehicles attacking without full combat load of ammunition.

SUPPLY LINES OF COMMUNICATIONS

Main supply route-- Autoban E4; alternate supply route-- Highways 84 to 62.

COMMUNICATIONS EMITTERS

Type	Nomenclature	frequency	mod	mux cap	pulse dur	pulse rep	bandwidth
R-104M	TAC RADIO	HF					
R-130	TAC RADIO	HF					
R-118	TAC RADIO	HF			(CLASSIFIED-- OMMITTED)		
R-126	TAC RADIO	VHF					
R-107	TAC RADIO	VHF					
R-123	TAC RADIO	VHF					

NONCOMMUNICATIONS EMITTERS

Type	Nomenclature	frequency	mod	mux cap	pulse dur	pulse rep	bandwidth
SA-4	PAT HAND						
SA-6	STRAIGHT FLUSH				(CLASSIFIED-- OMMITTED)		
SA-8	TELAR						

PERSONALITIES.

Appearance of General-Colonel Kostylev as Central Front CG surprising as he was expected to command the theater; highly feared, very political officer.

CG of 10 CAA, General-Lieutenant Reznichenco, able tactician, wrote much doctrine on offensive warfare.

CG of 7 TA, General-Lieutenant Pavlenko, highly favored in Kremlin, considered aggressive, somewhat reckless by Soviet standards.

9 GTD CG, General-Major Loszk, stable and dependable. Author of recent handbook on assault river crossings by armored forces.

71 GMRD CG, General-Major Suvorov, is young; little known about him.

128 MRD CG is unknown, believed not to have had this command more than 2 months.

AIR SUPPORT

Threat forces are supported by the 4th Air Army consisting of unidentified numbers of fighter bomber aircraft, ground attack aircraft, and reconnaissance aircraft. Air parity currently exists with either force capable of obtaining air superiority for limited periods of time. Up to now, threat forces have used a maximum of 40 fighter-bomber sorties in a 12-hour period.

NUCLEAR, CHEMICAL, AND BIOLOGICAL WEAPONS

No estimate of the threat nuclear support for the next 30 days is available. Threat currently has 152-millimeter gun/howitzers and surface-to-surface missiles capable of delivering 0.5 to 50 KT yield within range of our division.

No estimate of threat chemical and biological capability is available.

OTHER ENEMY FORCES

Special significance is given to the enemy 4th Airmobile Assault Brigade which has a capability for rapid insertion into our rear areas. There are no current indications of its employment in the 52 MID sector.

APPENDIX B:

UPDATE REPORTS

TO G-2, 52D MID
FROM S-2, 1ST BDE
HOURLY BATTLE SUMMARY ENDING 190700 AUG

PARA 3 ALFA: ENEMY TANK FORCES LAUNCHED ATTACK/SEIZED BERNDSHAUSEN (NB3354) AT 0600. MOTORIZED ELEMENTS CROSSED THE EFZE RIVER AT WALLENSTEIN (NB3445) BUT WITHDREW EAST OF THE EFZE BY 0630. HEAVY ARTILLERY FIRES CONTINUED ACROSS THE BRIGADE FRONT.

PARA 3 BRAVO: FLOT STARTS IN NORTH AT NB3455, RUNS SOUTH ALONG E4 TO VOLKERSHAIN (NB3347), THEN ALONG SECONDARY ROAD TO APPENFELD (NB3443).

PARA 4 BRAVO: EIGHTEEN ENEMY POWS CAPTURED VIC REMSFELD (NB3350) WERE PHYSICALLY EXHAUSTED FROM 48 HOURS WITHOUT SLEEP.

PARA 11: ENEMY FIRST AND SECOND ECHELON REGIMENTS CAPABLE OF LOCAL ATTACKS AND DEFENSIVE OPERATIONS.

PARA 12: PASS THROUGH OF SECOND ECHELON DIVISION TO CONTINUE ATTACK MOST PROBABLE.

TO G-2, 52D MID
FROM S-2, 2ND BDE
HOURLY BATTLE SUMMARY ENDING 190700 AUG

PARA 3 ALFA: NO ENEMY GROUND ATTACKS DURING PERIOD. FORWARD FORCES WITHDREW TO DEFENSIVE POSITIONS EAST OF HIGHWAY GREBENHAGEN-OBERAULA.

PARA 3 BRAVO: FLOT STARTS IN NORTH AT APPENFELD (NB3443), RUNS SOUTH ALONG HIGHWAY TO HAUSEN (NB3233).

PARA 3 FOXTROT: AERIAL ATTACKS BY MULTIPLE SORTIES OF MIG-27 FLOGGER D REPORTED VIC NB1935, NB2033 AND NB2032 ON BRIDGES CROSSING SCHWALM RIVER.

PARA 11: ENEMY FIRST AND SECOND ECHELON REGIMENTS CAPABLE OF LOCAL ATTACKS AND DEFENSIVE OPERATIONS.

PARA 12: PASS THROUGH OF SECOND ECHELON DIVISION TO CONTINUE ATTACK MOST PROBABLE.

TO G-2, 52D MID
FROM OPERATIONS CO, 52ND MI BN
HOURLY BATTLE SUMMARY ENDING 190700 AUG

PARA 3 ALFA: FRIENDLY AIRCRAFT ENGAGED BY MULTIPLE ZSU-23-4 VIC ATZELROD (NB4849).

PARA 7 ALFA: PATROL REPORTS MASSED 130T GUNS VIC RECKERODE (NB4234) BEARING MARKINGS OF 33 ARTILLERY BATTALION.

PARA 9: AERIAL RECON IDENTIFIES 83 TANK REGIMENT OF 9 GTD EQUIPPED WITH T-72 INSTEAD OF T-64.

PARA 11: ENEMY FIRST ECHELON DIVISIONS CAPABLE OF LOCAL ATTACKS AND DEFENSIVE OPERATIONS; SECOND ECHELON DIVISION CAPABLE OF OFFENSIVE OPERATIONS. SECOND ECHELON DIVISION VULNERABLE TO INTERDICTION WHILE CROSSING FULDA RIVER.

PARA 12: PASS THROUGH OF SECOND ECHELON DIVISION TO CONTINUE ATTACK MOST PROBABLE.

TO G-2, 52D MID
FROM S-2, 1ST BDE
HOURLY BATTLE SUMMARY ENDING 190800 AUG

PARA 3 ALFA: ENEMY ARTILLERY FIRE CEASES AT 0730.

PARA 4 CHARLIE: FOUR MEDIUM TANKS DESTROYED, TWO DAMAGED; THREE BMP/BRDM DESTROYED, FOUR DAMAGED; ONE JET AIRCRAFT SHOT DOWN.

PARA 7 ALFA: RANGER PATROL REPORTS BATTERY 130T GUNS FROM 31 ARTY BN AT NB405522.

PARA 11: ENEMY FIRST AND SECOND ECHELON REGIMENTS CAPABLE OF LOCAL ATTACKS AND DEFENSIVE OPERATIONS.

PARA 12: PASS THROUGH OF SECOND ECHELON DIVISION TO CONTINUE ATTACK MOST PROBABLE.

TO G-2, 52D MID
FROM S-2, 2ND BDE
HOURLY BATTLE SUMMARY ENDING 190800 AUG

PARA 3 ALFA: LARGE ENEMY PATROL PROBES FRIENDLY LINES VIC OBERAULA (NB3234).

PARA 4 CHARLIE: TWO MEDIUM TANKS DAMAGED, ONE SA-9 SAM DESTROYED, ONE BRDM DESTROYED.

PARA 3 ALFA: ENEMY PERFORMING DEMOLITION OF BUILDINGS IN SALZBERG (NB 3539).

PARA 11: ENEMY FIRST AND SECOND ECHELON REGIMENTS CAPABLE OF LOCAL ATTACKS AND DEFENSIVE OPERATIONS.

PARA 12: PASS THROUGH OF SECOND ECHELON DIVISION TO CONTINUE ATTACK MOST PROBABLE.

TO G-2, 52D MID
FROM OPERATIONS CO, 52ND MI BN
HOURLY BATTLE SUMMARY ENDING 190800 AUG

PARA 3 GOLF: ENEMY COMMUNICATION JAMMER LOCATED AND DESTROYED BY FRIENDLY ARTILLERY VIC EICHELSBERG (NB3954).

PARA 4 BRAVO: ENEMY COMMANDER OF 51 MOTORIZED RIFLE REGIMENT CAPTURED VIC MUNZENBERG (NB3332) BY PATROL WHILE PERFORMING FORWARD RECON. EVACUATED FOR INTERROGATION TO CORPS CEWI CELL.

PARA 6: GERMAN NATIONAL REPORTED LARGE QUANTITIES OF AMMUNITION BEING STOCKPILED VIC BAD HERSFELD (NB4836). REPORT RATING C-3.

PARA 11: ENEMY FIRST ECHELON DIVISIONS CAPABLE OF LOCAL ATTACKS AND DEFENSIVE OPERATIONS; SECOND ECHELON DIVISION CAPABLE OF OFFENSIVE OPERATIONS. SECOND ECHELON DIVISION VULNERABLE TO INTERDICTION WHILE CROSSING FULDA RIVER.

PARA 12: PASS THROUGH OF SECOND ECHELON DIVISION TO CONTINUE ATTACK MOST PROBABLE.

TO G-2, 52D MID
FROM S-2, 1ST BDE
HOURLY BATTLE SUMMARY ENDING 190900 AUG

PARA 3 ALFA: ENEMY COMPANY-SIZED AIRMOBILE INSERSION NEAR BRIGADE REAR BOUNDARY TEMPORARILY DISRUPTED MSR OPERATIONS FOR ONE HOUR.

PARA 8: COMPANY SIZED COLUMN OF T-64 TANKS SPOTTED MOVING WEST NEAR KONNEFELD (NB4355).

PARA 9: UNIDENTIFIED 122SP HOWITZER BATTERY LOCATED AT BRAACH (NB4850).

PARA 11: ENEMY FIRST AND SECOND ECHELON REGIMENTS CAPABLE OF LOCAL ATTACKS AND DEFENSIVE OPERATIONS.

PARA 12: PASS THROUGH OF SECOND ECHELON DIVISION TO CONTINUE ATTACK MOST PROBABLE.

TO G-2, 52D MID
FROM S-2, 2ND BDE
HOURLY BATTLE SUMMARY ENDING 190900 AUG

PARA 3 ALFA: HEAVY ENEMY ARTILLERY FIRE BEGINS ALONG BRIGADE FRONT AT 0845 HOURS.

PARA 7 ALFA: UNIDENTIFIED 152SP HOWITZER UNIT REPORTED NEAR UNTERGEIS (NB 4338).

PARA 8: CONVOY GSP FERRIES SPOTTED MOVING WEST THROUGH FRIELINGEN (NB3734).

PARA 11: ENEMY FIRST AND SECOND ECHELON REGIMENTS CAPABLE OF LOCAL ATTACKS AND DEFENSIVE OPERATIONS.

PARA 12: PASS THROUGH OF SECOND ECHELON DIVISION TO CONTINUE ATTACK MOST PROBABLE.

TO G-2, 52D MID
FROM OPERATIONS CO, 52ND MI BN
HOURLY BATTLE SUMMARY ENDING 190900 AUG

PARA 3 GOLF: RADIO SILENCE INITIATED ON 9 TD TACTICAL RADIO NET

PARA 7 ALFA: FROG BATTERY LOCATED VIC SCHWARZENHASEL (NB5352).

PARA 8: STRAIGHT FLUSH AIR DEFENSE RADAR REPORTED MOVING IN CONVOY ON HIGHWAY VIC ERSRODE (NB4147). TWO BRDMS BEARING MARKINGS OF 223 MRR REPORTED VIC BAUMBACH (NB4753) AT 0645 (REPORT RATING B-2).

PARA 11: ENEMY FIRST ECHELON DIVISIONS CAPABLE OF LOCAL ATTACKS AND DEFENSIVE OPERATIONS; SECOND ECHELON DIVISION CAPABLE OF OFFENSIVE OPERATIONS. SECOND ECHELON DIVISION VULNERABLE TO INTERDICTION WHILE CROSSING FULDA RIVER.

PARA 12: PASS THROUGH OF SECOND ECHELON DIVISION TO CONTINUE ATTACK MOST PROBABLE.